ENGINEER

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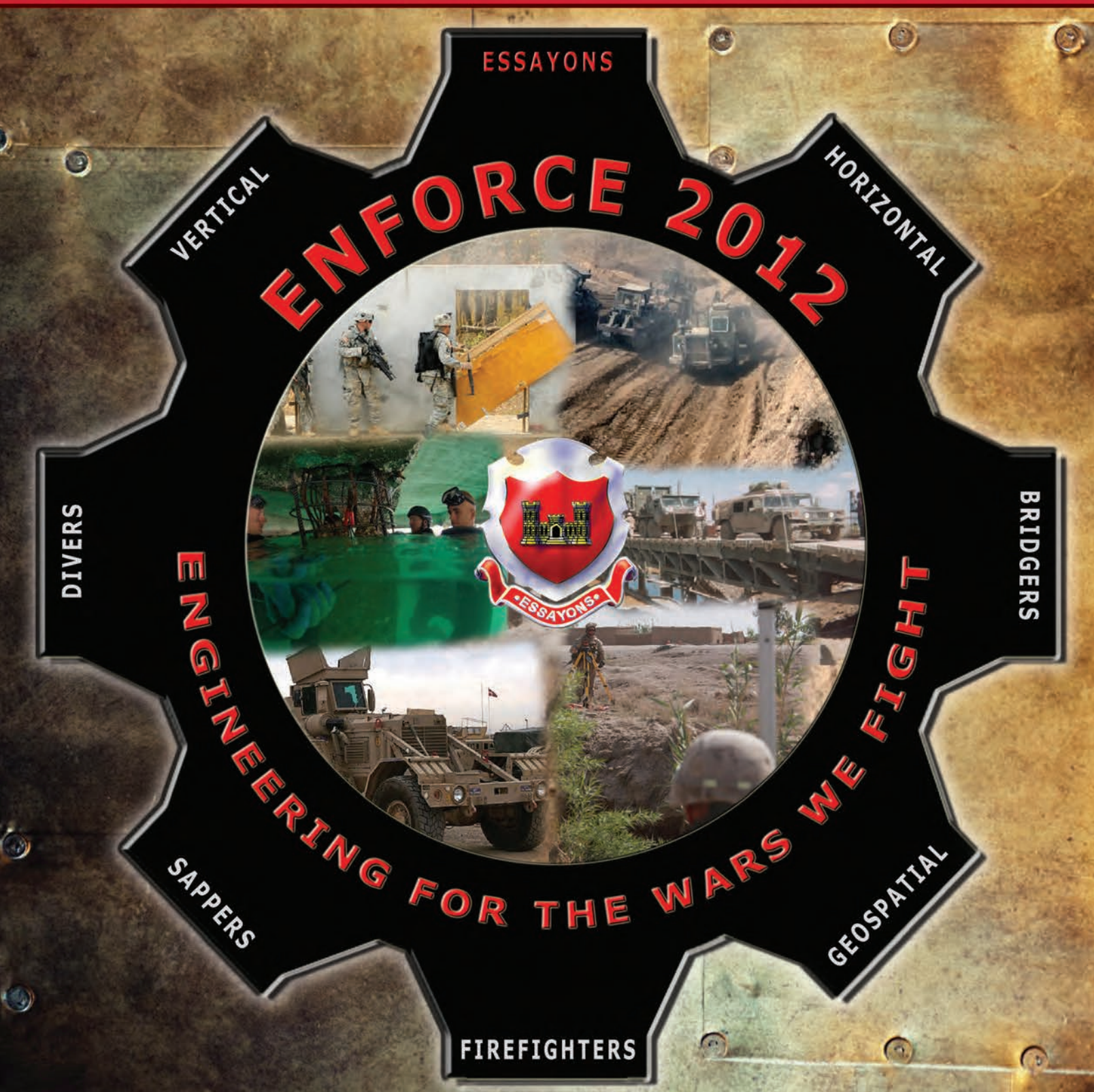
January–April 2012



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U.S. Army Engineer School

(573) 563-8080/DSN 676-8080

COMMANDANT
BG Peter A. (Duke) DeLuca
563-6192
<peter.deluca@us.army.mil>

ASSISTANT COMMANDANT
COL Fabian E. Mendoza, Jr.
563-6192
<fabian.mendoza@us.army.mil>

DEPUTY COMMANDANT
Mr. James R. Rowan
563-8080
<james.rowan@us.army.mil>

REGIMENTAL COMMAND SERGEANT MAJOR
CSM Terrence W. Murphy
563-8060
<terrence.murphy@us.army.mil>

REGIMENTAL CHIEF WARRANT OFFICER
CW5 Scott R. Owens
563-4088
<scott.owens@us.army.mil>

DEPUTY ASSISTANT COMMANDANT–USAR
COL Adam S. Roth
563-8045
<adam.roth@us.army.mil>

DEPUTY ASSISTANT COMMANDANT–ARNG
LTC Rodney M. Graham
563-8046
<rodney.m.graham@us.army.mil>

CHIEF OF STAFF
LTC Jose L. Aguilar
563-7116
<jose.aguilar@us.army.mil>

COMMANDER, 1ST ENGINEER BRIGADE
COL Allan Webster
596-0224, DSN 581-0224
<allan.webster@us.army.mil>

DIRECTOR OF TRAINING AND LEADER DEVELOPMENT
COL Daniel S. Larsen
563-4093
<daniel.larsen@us.army.mil>

DIRECTOR OF ENVIRONMENTAL INTEGRATION
Mr. Robert F. Danner
563-2845
<robert.f.danner@us.army.mil>

COUNTER EXPLOSIVE HAZARDS CENTER
LTC Chris Barron
563-8142
<chris.barron@us.army.mil>

HUMANITARIAN DEMINING TRAINING CENTER
Mr. Jonathan D. Green
563-6199
<jonathan.d.green@us.army.mil>

ENGINEER DOCTRINE, MSCoE CDID, CODDD
MAJ Sinlan Morrow
563-2717
<sinlan.morrow@us.army.mil>

MANEUVER SUPPORT ORGANIZATION
Mr. Don Wenzel
563-7264
<don.wenzel@us.army.mil>

MANEUVER SUPPORT MATERIEL
LTC Chris A. Parks
563-5055
<chris.parks1@us.army.mil>

By Order of the Secretary of the Army:

RAYMOND T. ODIERNO
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
1135501

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U.S. ARMY ENGINEER SCHOOL

COMMANDANT
Brigadier General Peter A. (Duke) DeLuca

MANAGING EDITOR
Diane E. Eidson

EDITOR
Rick Brunk

GRAPHIC DESIGNER
Jennifer Morgan

EDITORIAL ASSISTANT
Phyllis E. Grayson

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Clear the Way

Brigadier General Peter A. (Duke) DeLuca
Commandant, U.S. Army Engineer School

Engineering for the Wars We Fight

Engineering for the Wars We Fight is the theme of this year's U.S. Army Engineer Regimental Conference (commonly known as ENFORCE)—a conference that not only includes the celebratory and competitive aspects of our annual gathering, but also has a very substantive and productive focus on what we are doing in combat, what we need to be doing in combat, and what we are doing each day to ***prevent***, ***shape***, and ***win*** now and in the future.

The conference will focus on the expected operational environment during the next few years, not take a hypothetical look into the future far beyond our ability to predict anything about the strategic context in which we must work and adapt. Nor will this conference rely on sterile scenarios amenable to popular and convenient assumptions about the nature of war and the skills, tools, and resources needed to fight them. These types of dysfunctional approaches have hampered our ability to think clearly at strategic transition points in the past and cannot be allowed to recur. And, of course, prevention and shaping operations include theater engagement; engineer preparation of theater actions; defense support of civil authorities and its foreign equivalent, partner capacity building; and U.S. Army Corps of Engineer (USACE) support to our Nation and international foreign aid and security operations. USACE and the field Army engineers are one Regiment, and we must work very closely to deliver the engineering effects that our forces and our Nation need. This year's conference will have a variety of activities that are designed to further this goal.

While our Engineer Regiment continues to perform doggedly and superbly in support of maneuver forces and commanders around the globe and at home, it is no secret that the context in which we operate is changing. The geopolitical situation, the economy, the operational environment, and our strategy are going through transitions that guarantee tremendous uncertainty; but these transitions also provide an unprecedented opportunity to reshape our Regiment into the precise form and capacity that our Nation needs. So ***now*** is the time to reshape our Regiment, and we will do it together. Most of you are aware of the discussions about our Profession of Arms, the discussions and pending decisions of Army 2020, the reductions in our budget, the termination of one major theater, and the impending termination of a second major theater within the next 2 years. These and other global changes have a significant impact on our Army and the engineers entrusted with supporting decisive land operations to protect our citizens and national interests and to ensure our Nation's continued prosperity for our children and grandchildren.

We will gather at Fort Leonard Wood 17–21 April. The ENFORCE agenda will allow us to visualize the operational environment through multiple national and cabinet level experts who will discuss the hybrid threats, the operational environment, and the Army 2020 and Engineer Regiment plans to meet the future operational environment. We will host major addresses from a cabinet official, U.S. Army Training and Doctrine Command (TRADOC) senior leaders working the Army 2020 concept (which is already reshaping our Army), the Chief of Engineers, the Maneuver Support Center of Excellence commanding general, senior members of our U.S. Army Reserve and U.S. Army National Guard, brigade members who have recently returned from combat or who are still in combat, and at least two foreign partner chief engineers. These discussions and panels will provide a breadth of information and perspective unmatched during any other event. Our USACE team will conduct a Commanders' Conference and the Installation Management Command team will conduct a Department of Public Works Conference almost concurrently with ENFORCE, overlapping key events of interest.

Our panel discussions will focus on joint/international, interagency/intergovernmental, special operations forces, and geospatial/geointelligence operations; and the working groups will focus on training and training support to our Regiment. Senior level members will address the plenary sessions, and then working groups will refine draft products and plans to be implemented after ENFORCE.

We will also conduct the usual social and commemorative engagements to encourage professional dialog and foster continued camaraderie. Holding events such as the solemn Fallen Sapper Memorial Service and the joyful Engineer Regimental Ball is our duty. We honor our fallen, who along with their families made the selfless, ultimate sacrifice; and we continue the observance of our most ancient traditions and celebrate them as Soldiers of this

(Continued on page 47)

Lead the Way

Command Sergeant Major Terrence W. Murphy
Regimental Command Sergeant Major

As the U.S. Army transitions to the Army of 2020, the Engineer Regiment will continue to provide the best training and resources for our leaders and Soldiers. While the Army senior leaders grapple with budget issues and work to determine what the Army will look like in the future, we as a regiment must continue to strive for excellence. The Army of 2020 represents many changes in the force and the way the Army operates. The Brigade Engineer Battalion concept is still on the table and is a vital part of the Engineer Regiment strategy to build the right force for the engineers and to place the best type of formations in the brigade combat teams to assist as they become more lethal and agile. This strategy is about providing the best assets under the right mission command node to ensure that they are trained and employed in the best manner to benefit not only the brigade combat team but the Army as a whole.

We recently launched the officer version of the Army Career Tracker (see page 43). (The enlisted version has been out for some time.) The Web site allows you to sign in to track your career path and to select a leader and mentor(s) who can provide guidance for career planning and direction. As you look at the site, you will find links to Army sites and to other engineer sites. Education is a key in the military and civilian worlds. There are links to the College of the American Soldier at <*http://www.tradoc.army.mil/INCOPD/cas.html*>; to structured self-development courses at the Army Training Requirements and Resources System Web site at <*https://atrrs.army.mil/*>; and to other sites that assist in career advancement.

The Regimental Command Sergeant Major blog site, <*https://www.milsuite.mil/login/login?goto=https%3A%2F%2Fwww.milsuite.mil%3A443%2Fbook%2Fgroups%2Fcsms-orp*>, recently featured a conversation about NCOs providing articles to professional publications. Our NCO Corps is the best in the world, knowledgeable and professional. Sharing knowledge and professional opinions fuels spirited debate and assists others. As NCOs, we are part of the Army profession and should be part of the discussion. When we shy away from presenting our professional opinions, we minimize ourselves among our comrades.

We are continuing to develop more professional standards and additional skill identifiers (ASIs) for our Soldiers. Recently, the Engineer Regiment instituted the Sapper Leader Course ASI (S4) and combat engineer heavy tracked vehicle operator ASI (B6). These ASIs recognize professionalism and provide credentials for special disciplines in certain areas of the Engineer Regiment. Units are now being fielded with the assault breacher vehicle (ABV), which features mine-clearing line charges and proofing and marking capabilities in one package mounted on an M-1 Abrams tank chassis. The B6 ASI course is the certification mechanism for the ABV, the M9 armored combat earthmover (ACE), and others in that family of armored vehicles. As fielding plans appear on long-range unit calendars, plan ahead by sending your operators to Fort Leonard Wood, Missouri, for training. The B6 ASI course has been underutilized so far, but provides good service to units that have the ABV and similar vehicles. Units in the fielding window should take advantage of the course and get their operators certified.

Finally, as professional Soldiers in the Engineer Regiment, we have a duty to look for more educational opportunities. We do not have many degreed or credentialed enlisted Soldiers in our profession. The NCO Education System is our professional military education system, and those who are eligible to attend Advanced and Senior Leaders Courses should place a high priority on attending them. It is an individual responsibility and should be a priority for NCOs to attend once they become promotable sergeants, staff sergeants, and sergeants first class. Although it may take Soldiers away from home for a short period of time, the benefits are huge for the NCOs and for the units that gain increased knowledge in their leaders. The pace of deployments has slowed over the years, and we must reduce the backlog of course attendance.

As this year continues, we are moving toward ENFORCE 2012, which will be held at Fort Leonard Wood from 17 to 21 April 2012. The culminating event of the week will be the Engineer Regimental Ball on the evening of 21 April. The week brings the global regimental team together in a major team-building event and is an educational time period where engineers discuss serious topics that will affect the Engineer Regiment in the future. The Best Sapper Competition will also be held during that week, as the best of the best sappers come together to compete in a grueling contest. Come out and join us, and be a part of our annual event showcasing the best regiment in the U.S. Army.

Essayons!

Show the Way

Chief Warrant Officer Five Scott R. Owens
Regimental Chief Warrant Officer

Greetings everyone. I hope that the New Year is finding you safe and that you and your families are doing well. As I write this, Christmas is almost upon us, but by the time you read it, ENFORCE will be in session. Speaking of ENFORCE, it has been getting better and better every year and this year promises to continue to build on that momentum. For engineer warrant officers, ENFORCE 2012 will have even more significance since our first geospatial engineering technician (military occupational specialty 125D) Warrant Officer Basic Course will graduate shortly afterward.

As you know, the Army will undergo a major transition over the next several years. As I reflect on the Army's history, I can't help but recognize that we have always been in a state of change. The changes are sometimes sweeping and sometimes incremental, but they are always focused on meeting current and future challenges. What haven't changed are the men and women who volunteer to serve as professional Soldiers in the U.S. Army. Many serve one or more terms, while others serve an entire career with a passion and commitment that most people will never totally understand.

Over the past few months, I've had the pleasure of visiting with Soldiers, attending ceremonies and graduations, and speaking at receptions for Engineer Basic Officer Leader Courses and Warrant Officer Basic and Advanced Courses. Meeting these Soldiers and leaders, some of whom are just starting out and others who are midway through their careers, fills me with reassurance that the future of the Army is in good hands. Nearly everyone I meet is driven by a passion that is best described as written in the U.S. Army Profession of Arms Campaign: "The American Professional Soldier is a volunteer . . . bonded with comrades in a shared identity and culture of sacrifice and service. . . ." Comradeship is what Soldiers are forming while training here in their basic courses at Fort Leonard Wood, Missouri. When they come back throughout their careers for advanced military training, they will reaffirm those relationships while building new ones as they share their experiences and knowledge.

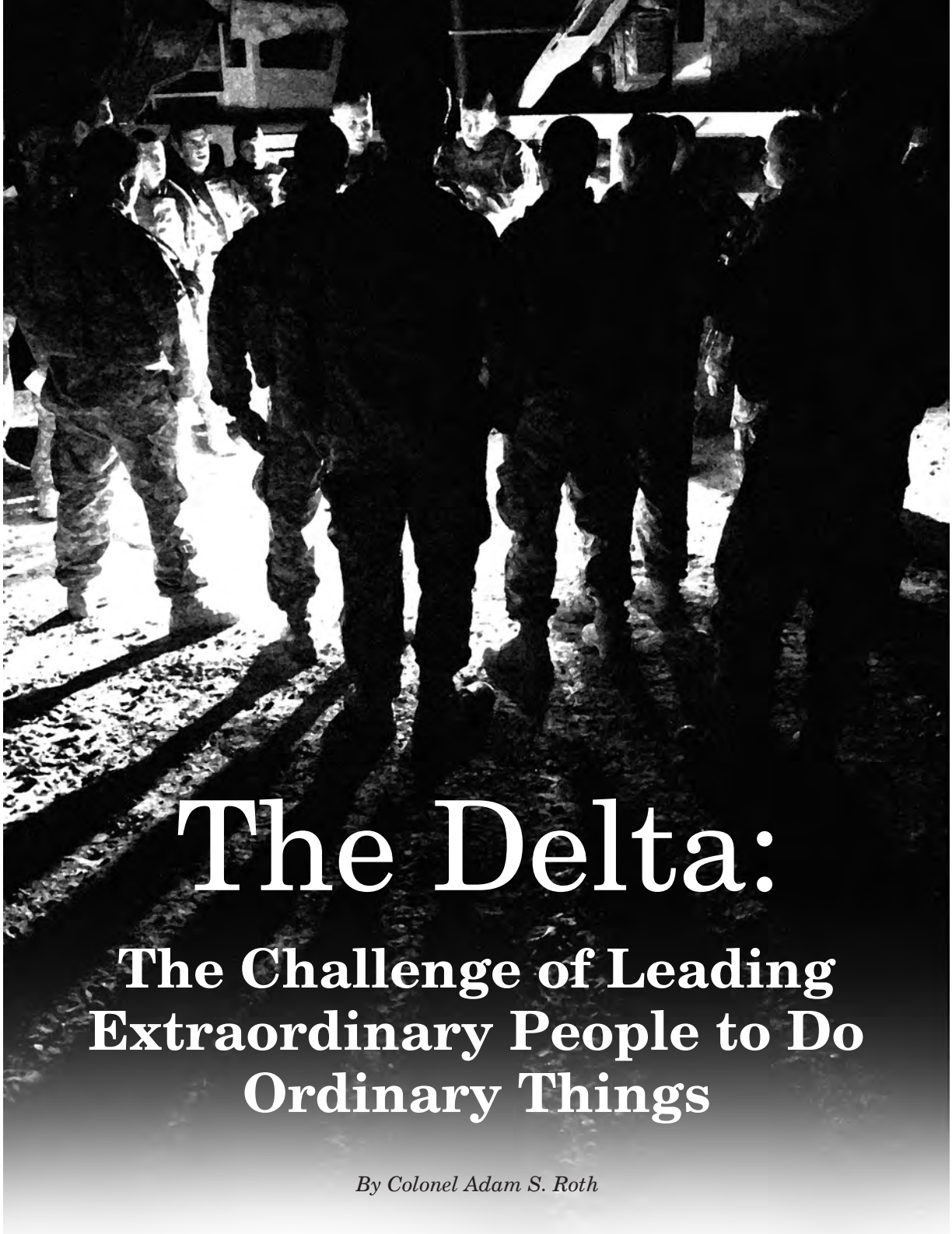
It has been a great honor to get to know some of those Soldiers, and it is my honor to represent you, my fellow engineer warrant officers. Over the next year, Chief Warrant Officer Four Jerome Bussey (your assignments manager) and I will be visiting many of your locations. We will meet with you and your Soldiers, discuss emerging warrant officer issues, and hear firsthand any concerns you might have. I'm looking forward to seeing each and every one of you. Until then, I hope that you will stay safe and that I will see many of you at ENFORCE.

For information about how to become an engineer warrant officer, log on to the U.S. Army recruiting Web site at *<http://www.usarec.army.mil/hq/warrant>*. For information about the Army Profession Campaign and about engineer warrant officer issues, log on to the following Web sites:

- *<http://cape.army.mil/ArmyProfession.html>*.
- *<https://www.milsuite.mil/book/groups/senior-engineer-warrant-officer-group>*.
- *<https://www.milsuite.mil/book/groups/engineer-branch-junior-warrant-officer-group>*.

Essayons et Faissons!

"The American Professional Soldier is a volunteer . . . bonded with comrades in a shared identity and culture of sacrifice and service. . . ."



The Delta:

The Challenge of Leading Extraordinary People to Do Ordinary Things

By Colonel Adam S. Roth

When we speak of those who are decorated for bravery or heroism, a frequent comment is that they were ordinary people doing extraordinary things. As the current wars wind down, we have grown a force that is—without reservation—the most combat-proven force in generations. These were volunteers who came forward and served in a time of war. They were frequently placed in positions where life or death decisions had to be made immediately; and frequently, the results were stellar. This is the force we have today. They are Soldiers who expect to be treated as adults, having had that responsibility in theater and having gained life experience during deployment. But how do you get Soldiers who have been slaying dragons for a year to now set their sights on smaller targets and do ordinary things—and ***want*** to do them?

While serving at the U.S. Army Engineer School, Fort Leonard Wood, Missouri, I regularly conduct outbriefings with U.S. Army Reserve students as part of their Engineer Basic Officer Course. I start out with a simple question: What is it that you haven't learned during the course,

"This is the force we have today. . . . having had that responsibility in theater and having gained life experience during deployment. But how do you get Soldiers who have been slaying dragons for a year to now set their sights on smaller targets and do ordinary things—and want to do them?"

but want to? Almost invariably I get the same set of topics that includes—

- Counseling.
- Noncommissioned Officer Evaluation Reports (NCOERs).
- Officer Evaluation Reports.
- Command Supply Discipline Program.
- Command Maintenance Discipline Program.

Although it is not a doctrinally correct term, the lost art of "garrison leadership" is the locus of those topics. Growing up as a lieutenant in Germany, many of these topics occurred with regularity and created stability and predictability for the Soldiers of U.S. Army Europe before the fall of the Berlin Wall. As the wars in Iraq and Afghanistan terminate or decrease in scope, white space appears more frequently on training schedules. The patch chart, though vitally important for driving operational tempo for the past 10 years, will no longer be the sole driver of training. The next generation of leaders may not start their lieutenant years on an operational deployment, but rather learn to master the art of garrison leadership while having time on their hands to focus on ordinary things. This article focuses on training that supports that end—the mastery of garrison leadership. It is our collective challenge to take these extraordinary Soldiers and make them want to do the ordinary things that comprise garrison leadership tasks.

Counseling

I cannot overstate the importance of counseling at every level. In units where I have served, leaders have often been frustrated with individual Soldiers. When I ask the leaders if they have counseled the Soldiers or documented their performance, the usual answer is that they have never had the time. When I dig further down, I usually see that they have never really understood ***how*** to counsel Soldiers. My first exposure to counseling was at the Infantry Officer Basic Course in 1988, where we conducted role-playing with real Soldiers. The quality and realism of that training were so vivid that when I met the instructor again recently, we could recall word for word what was said 23 years ago. Whether using a Department of the Army (DA) Form 4856, *Developmental Counseling Form*,[1] or an informal document of your own creation, you need to take the time to establish expectations and standards with each subordinate in your organization. If you can quantify those expectations and standards, so much the better.

The other step in the process, sometimes overlooked, is to truly listen to what subordinates say, get their perspective on what was said, and discover what their personal goals are. While conducting counseling sessions with students at the Engineer School, I am frequently amazed at their reaction to having a senior leader sit down, one on one, to discuss their careers, dreams, and issues. Taking the time for these sessions has been a personal priority for me, and I hope that the result will be a generation of junior leaders who will do the same with their subordinates. In order to grow our next generation of leaders, this sort of hands-on career management is probably one of our most solemn duties.

NCOERs

As a battalion commander, I often saw substandard NCOERs. Sometimes they were simply a cut and paste from the last noncommissioned officer (NCO) who was rated. On my last deployment, we took the opportunity to conduct a 2-day workshop on a litany of topics, to include NCOERs. Under the direction of the battalion command sergeant major, we trained more than 200 NCOs during the deployment, and the resulting NCOERs improved markedly. The key points of completing good NCOERs come back to counseling, setting realistic goals with appropriate metrics, and getting feedback. The rater and the rated NCO need to ensure that the duty description is meaningful and includes details such as the number of people supervised and the value of equipment for which the NCO is signed. The rater and senior rater also need to know the correct career progression for the NCO. Do they have DA Pamphlet 600-25, *U.S. Army Noncommissioned Officer Professional Development Guide*,[2] open in front of them to see logical future positions for the NCO and to determine what key and developmental positions are available; or are they simply writing in "squad leader" or "platoon sergeant" as recommendations? Finally, counseling and final NCOERs need to be done on a timely basis. If a final NCOER is late, the leader has failed the Soldier and the Army. If proper NCOER procedures are not part of the culture in your unit and you're not tracking such ordinary things at your level, there will be harmful consequences. Only you, the leader, can change this situation.

Officer Evaluation Reports

The bedrock of this process is DA Form 67-9-1, *Officer Evaluation Report Support Form*.[3] Though some changes to the form are coming, including the return of a block check for senior raters other than field grade officers, the concept and importance of this form will remain the same. The first instinct for any officer when meeting the new boss should be to leave that meeting with a copy of the Officer Evaluation Report Support Form. It is not infrequent that a rater, especially in the Reserve Components, does not have a copy of the form available. The rated officer should nonetheless prepare a support form for feedback. This document serves as a sort of contract between the rated officer and the rater and as a blueprint for how the leader will measure the performance of the subordinate. Raters and senior raters must develop attainable metrics to gauge that performance. The metrics should include not just easily quantifiable things, such as the number of Soldiers who have undergone urinalysis, but also harder ones, such as the development of a training plan that materially contributes to the improvement of the unit's rating on the unit status report. Finally, it is crucial that leaders provide their officers—especially the most junior officers—with quality feedback. The impact of corrective or reinforcing counseling is the biggest combat multiplier that I have experienced, and time is the only cost for this ordinary task.

Command Supply Discipline Program

This is critical to our success as leaders, especially as equipment and supplies stop flowing as freely as they have for the past 10 years. Leaders will have to regularly account for what they have, to show due diligence, and to avoid that signature wound inflicted on commanders by the current wars—the financial liability investigation of property loss. Leaders will need to know what constitutes an end item; what the components of that end item are; what basic issue items come with it; and what sets, kits, and outfits are involved. Whether a commander decides to perform 10 percent inventories monthly or 25 percent inventories quarterly, the creative leader should see this as a training opportunity for subordinates and thereby renew the lost skills of garrison leadership.

Command Maintenance Discipline Program

Especially important in mechanized or wheeled vehicle units, this program should be bread and butter for leaders. Regular Monday morning *motor stables* were a staple of existence in U.S. Army Europe. But there were other staples too, including mileage restrictions that prohibited the use of tracked vehicles for more than 800 miles—in an entire year. Leaders should be in the motor pool with their Soldiers. If they have vehicles assigned to them, they should also participate in the normal preventive maintenance checks and services process for the vehicle. The fact that many of the vehicles we have operated in the past 10 years have been maintained by contract workers has created a divide between Soldiers and their equipment.

But maintenance is not only about automotive equipment. When is the last time your Soldiers pulled good preventive maintenance on their weapons; communication equipment (to include radio checks with a company or battalion tactical operations center); or their chemical, biological, radiological, and nuclear protective gear? Leaders need to know how to do these tasks, demonstrate their leadership through their physical presence in the mud with their Soldiers when they pull a drive sprocket on a Bradley fighting vehicle in the mud, and use these ordinary things as training vehicles to teach the next generation of Soldiers.

It is not my intention to turn back the clock to an Army that will never be again. It is, however, imperative to recognize that the muscle memory from some of those skills, learned so long ago, have atrophied. Before many of the senior leaders who started during the Operation Desert Shield/Desert Storm era retire, it is imperative to renew those garrison leadership skills for leaders who weren't even born in a time when there were two Germanys. Our Soldiers, our Army, and our Nation deserve nothing less.

Endnotes:

[1]DA Form 4856, *Developmental Counseling Form*, August 2010.

[2]DA Pamphlet 600-25, *U.S. Army Noncommissioned Officer Professional Development Guide*, 28 July 2008.

[3]DA Form 67-9-1, *Officer Evaluation Report Support Form*, October 2011.

Colonel Roth serves as the Deputy Assistant Commandant (Army Reserve) at the U.S. Army Engineer School. Before his graduation from the U.S. Army War College, he commanded the 844th Engineer Battalion and deployed to Iraq as part of Task Force Sky. He is a graduate of the U.S. Army Command and General Staff College and holds a master's degree in mechanical engineering from Boston University.

Bridging the Engineer Gap From Tactical to Strategic

By Mr. J. Erik Fleischner, Lieutenant Colonel Frank E. Hopkins III, and Lieutenant Colonel Damon G. Montgomery

Many times, engineers are thrown into an exercise regardless of their training. The result is the placement of tactical engineers at an operational level for which they don't have the appropriate skill set. Engineers who can bridge this gap are the "Heroes of the Exercise," providing engineer planning and reachback to consistently stay ahead of the commander's decision cycle.

In 2009, the first joint force engineer command (JFEC) was activated in Afghanistan, centralizing engineer efforts and assets across the theater to facilitate and coordinate engineer operations. In 2011, U.S. forces saw another first for the JFEC concept; the integration of this team of engineers from all services in support of U.S. European Command (USEUCOM). With help from the U.S. Army Corps of Engineers (USACE) and the U.S. Army Reserve 416th Theater Engineer Command, USEUCOM tested the JFEC ability to coordinate engineer assets outside the war zone during a training exercise. A deployable command post (DCP) (Figure 1) was established that required modifying the joint manning document to incorporate field force engineering and service component engineers to become a JFEC.

The exercise simulated major combat operations from the reception, staging, onward movement, and integration of troops and equipment through the "Phase III–Dominate" operations of the joint campaign. To support operations, the JFEC—

- Facilitated informative update sessions and mission planning synchronization meetings to increase the engineer unity of effort.

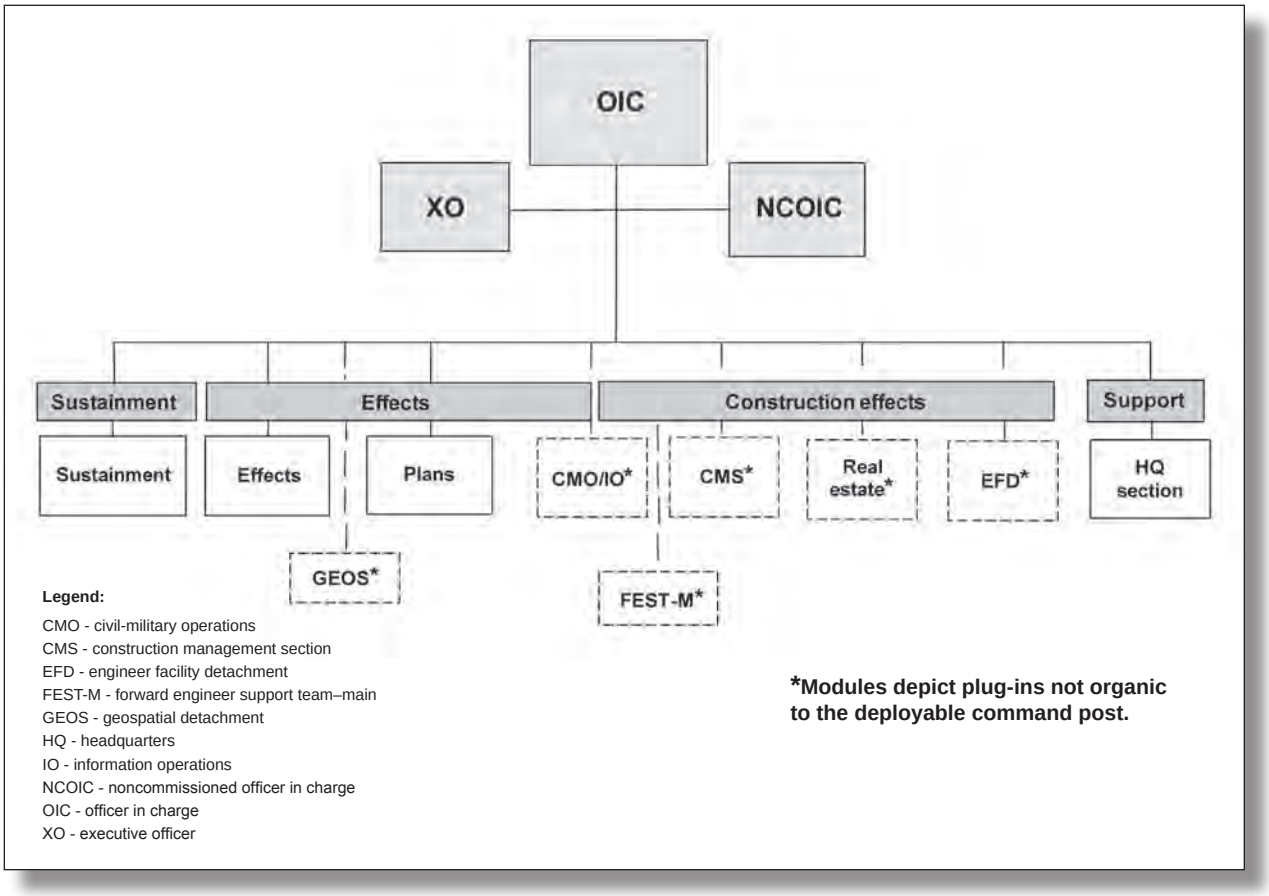


Figure 1. Deployable command post

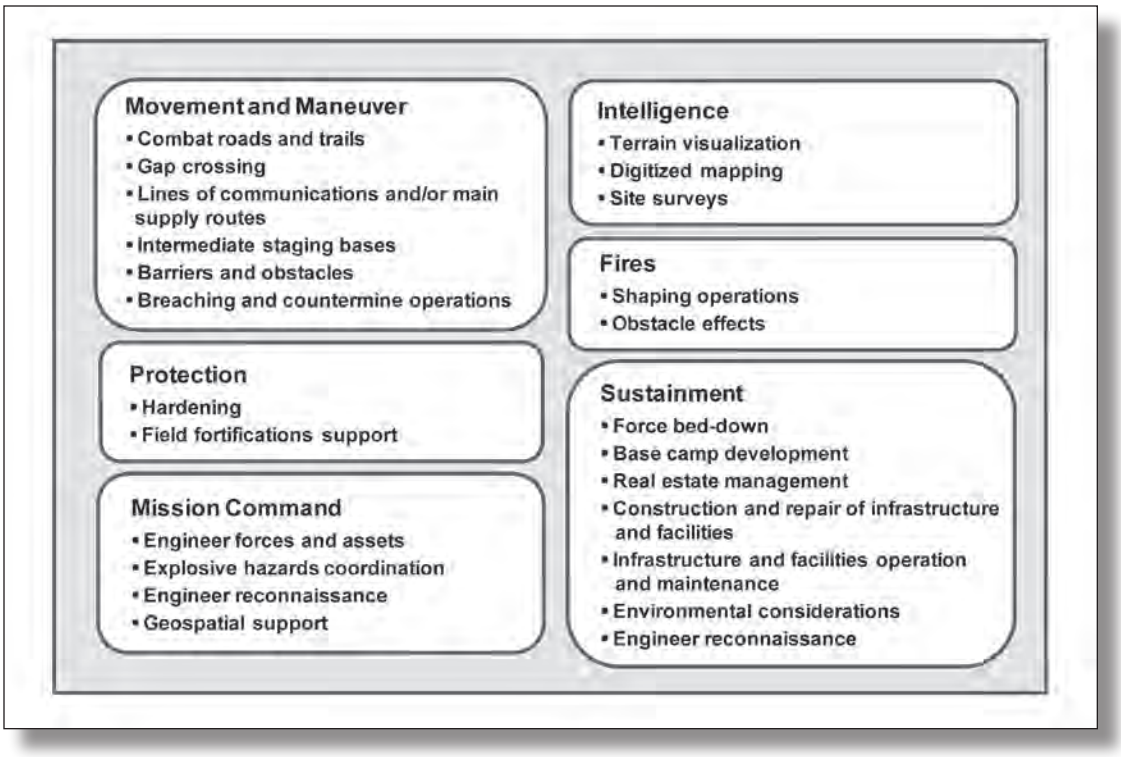


Figure 2. Engineer support to joint functions

- Coordinated effects—tactical through strategic—of U.S. and coalition engineers.
- Established a request-for-information process for the transparency of information requirements.

USACE and the 416th Theater Engineer Command were also heavily involved in developing a master scenario events list, generating events that would provide the desired engineer support to joint functions (Figure 2).

Effective Demonstration

The exercise was an astounding success. The JFEC demonstrated the effectiveness that its structure and flexibility provided, based on the joint engineer capabilities inherent in the organization. The JFEC was a superior fit for joint task force (JTF) engineer operations. The team's efficiency was repeatedly demonstrated by its adaptive response to the scenario and its technical analysis of more than 20 situational events. Response times and communication up and down the engineer chain were exceptional. All engineer events injected were successfully analyzed, resolved, and communicated between the JFEC, the JTF, USEUCOM, and all subordinate commands via daily engineering synchronization meetings.

The USACE field force engineering cadre embedded in the exercise acted as a forward engineer support team and simulated field force engineering support from forward engineer, contingency real estate, and environmental support teams. Whenever forward engineer support team members were not working on requests for information or products, they were anticipating future missions such as conducting river crossings, restoring key infrastructure, developing infrastructure products, and researching responses. The exercise also tested the forward engineer support team's ability to establish and use teleengineering communications equipment to communicate with the USACE Reachback Operations Center in Vicksburg, Mississippi; conduct reconnaissance; develop a base camp; and test contracting and acquisition support.

During the exercise, the JFEC supported both the JTF engineer and the combatant command engineer. To do this, the staff was divided as illustrated in Figure 3, page 10. This allowed the JFEC to provide additional operational and tactical engineering capabilities not normally available during an exercise. It gave USEUCOM a powerful liaison connection to the engineers on the ground. Service engineers were integrated from the strategic level down to the tactical level, with the JFEC facilitating engineer coordination. The JFEC configuration into "effects," "construction effects," and "operations" functional teams created a significant force multiplier for future engineer operations and planning. The effects team focused on assured mobility in order to provide combat engineering support to enhance protection. The construction effects team focused on base and host nation infrastructure to support the JTF commander's campaign plan. The operations team managed the functions of the JFEC.

In future exercises or operations, the JFEC configuration and duties for the task-organized effects and operations teams would include the usual functions of

current operations, future operations, and plans, with the addition of reachback assistance for the following:

- Contract construction.
- Heavy construction.
- Theater construction management system.
- Battle tracking.
- Targeting.
- Infrastructure assessments/sewer, water, electricity, academics, trash, medical, safety, and other considerations.
- Basing and base camp development.
- Bed-down.
- Route clearance.
- Lines of communication such as roads, railways, ports, and airfields.
- Environmental baselines.
- Real estate.
- Report generation.
- Task organization.
- Power generation.
- Geospatial.

The JFEC maintained an operational and tactical focus on engineer activities in each of the countries inside the joint operations area. This allowed USEUCOM engineers to maintain strategic focus and synchronize all engineering activities throughout the theater.

Proficient Coordinating Mechanism

The JFEC was a force multiplier, providing a proficient coordinating mechanism for exercises and real-world operational requirements, bridging the gap between the tactical and strategic levels. It provided exceptional engineer planning and reachback that allowed engineers to stay ahead of the commander's decision cycle. While the JFEC can do it all, it is not necessarily a catchall solution for every JTF. If the JTF headquarters is based around a corps or division headquarters, there would probably be sufficient engineer staff that a JFEC would not be needed. However, if the JTF engineer needs mission command, is based on an Army service component command, or is operating a standalone JTF that was built from scratch, the JFEC concept can correct an engineer staff shortage.

Depending on the mission and the assigned forces, the theater engineer command DCP (with joint augmentation) can transition into one of two functional roles. When there are theater level engineer forces such as forward engineer support teams or prime power, topographic, or theater construction units, the theater engineer command DCP provides mission command for these units and forms the basis of the joint force commander's engineer staff. When mission command is not needed, the theater engineer command DCP can still be an extension of the geographic combatant command engineer staff or form the base of the engineer staff and would be designated as the joint forces engineer directorate (JFED) (Figure 4).

Focus on Joint Operations

Sometimes staff maneuver elements have interpreted the command part of "joint force engineer command" to mean that the JFEC is a maneuver element; thus the recommendation for designation as a directorate when applicable. This would allow the geographic combatant command to use the JFED as a combatant command engineer asset, pushed forward to focus on the joint operational area while the actual combatant command engineer focuses on the entire theater. Far too often, the combatant command engineer staff assumes risks while covering down on both missions (in the real world and during exercises). The JFED would transition from a hypothetical concept to a real capability by using Soldiers from the theater engineer command DCP, which is standard practice today. They would become the JFED once the service component engineer linkage was established. In addition to service component engineer augmentation to maximize service competency, the JFED would receive designated liaison officers from the three contract construction agencies—USACE, the Air Force Center for Environmental Excellence, and the Naval Facilities Engineering Command—

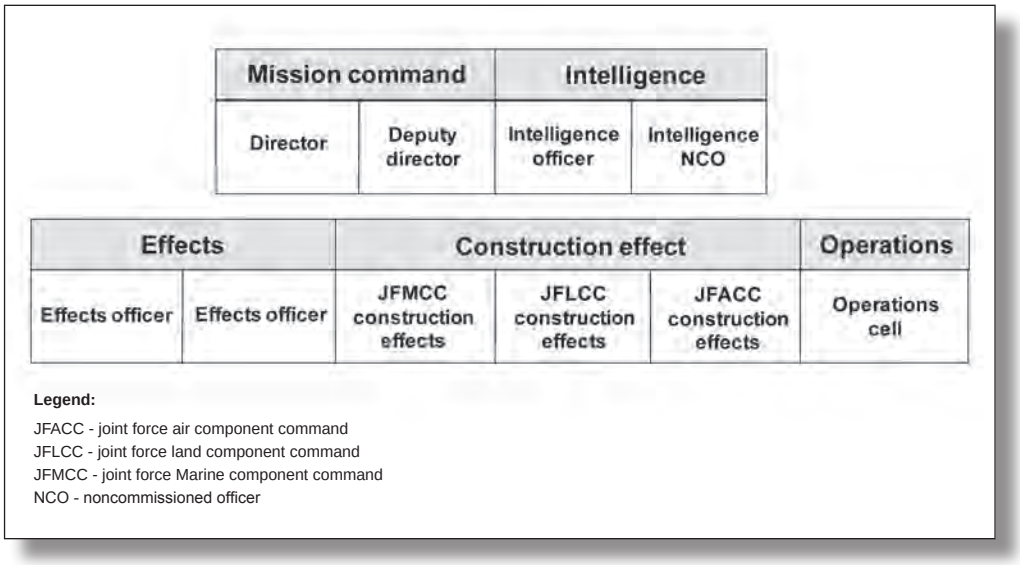


Figure 3. Exercise concept

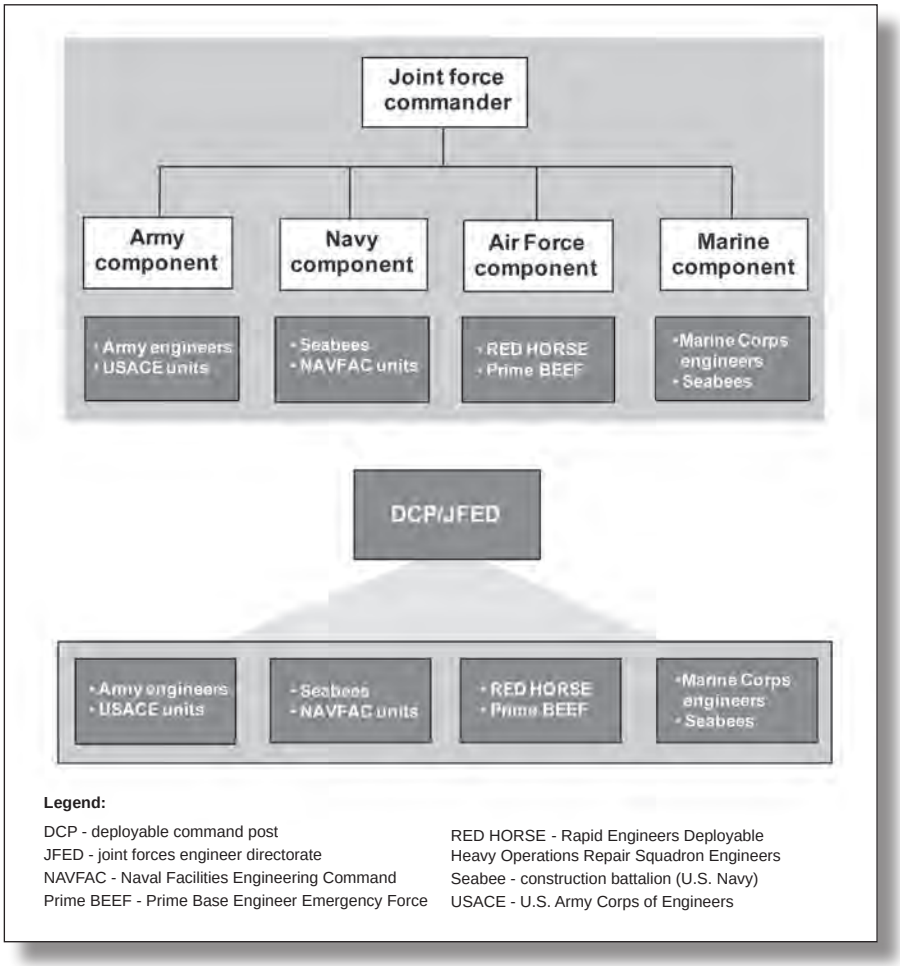


Figure 4. Theater engineer command deployable command post change to JFED

as well as coalition and host nation liaison plug-ins to facilitate the best use of partner and host nation engineering and contracting capabilities. The theater engineer command DCP would still support the Army service component command theater-wide administrative control responsibilities; but in this particular case, the theater engineer command DCP would assume a joint engineer mission by incorporating service component engineers.

Under the legacy engineer command structure, the 412th and 416th Engineer Commands had habitual relationships with the geographic combatant commands and their Army service component commands—the 412th Engineer Command with USEUCOM and U.S. Pacific Command and the 416th Engineer Command with U.S. Central Command and U.S. Southern Command. In 2009, the 412th and 416th Engineer Commands received permanent orders to reorganize and were redesignated the 412th and 416th Theater Engineer Commands. After this transformation, the habitual relationships ended, allowing DCPs from both theater engineer commands to support any Army service support command or geographic combatant command contingency operation. By continuing the established model of having a theater engineer command DCP on the joint manning document as the base for a JFEC or JFED, the theater engineer command DCPs can deploy small teams to the joint task force and the combined forces land component command engineer staffs. By serving as the theater engineer staff and specializing in joint engineer functions, the JFED can become a learning organization, maintaining cohesion during geographic combatant command personnel turnover.

This JFEC/JFED concept was put into practice for USEUCOM. Because of coordination between the staffs of the 416th Theater Engineer Command and the USEUCOM Directorate of Logistics and Security Assistance, the exercise made the JFEC concept a reality for geographic combatant command use. There is now a methodology to transform the concept into reality. The next steps will be to standardize the JFEC and JFED naming convention for supported maneuver units and to secure a commitment from geographic combatant commands to fill engineer joint manning document requirements with theater engineer command DCP JFEC/JFED functional capabilities.

Mr. Fleischner is the USACE liaison officer to USEUCOM. His military education includes the U.S. Army Command and General Staff College, the Joint Engineer Operations Course, Engineer Officer Basic and Advanced Courses, and U.S. Army Airborne and Ranger Schools. He holds a master's degree in environmental engineering from the University of Florida, Gainesville.

Lieutenant Colonel Hopkins is the 416th Theater Engineer Command deputy chief of staff for plans. He is a graduate of Intermediate Level Education Core and Advanced Operations Courses at the U.S. Army Command and General Staff College, the Joint Engineer Operations Course, the Engineer Captains Career Course, and Engineer Officer Basic Course. He holds a master's degree in military arts and science from the U.S. Army Command and General Staff College.

Lieutenant Colonel Montgomery is the contingency and exercise planner for USACE–Europe District. He is a graduate of Advanced Joint Professional Military Education; Intermediate Level Education Core and Advanced Operations Courses at the U.S. Army Command and General Staff College; the Joint Engineer Operations Course; the Engineer Officer Advanced Course; the Field Artillery Officer Basic Course; the Lance Missile Officer Course; and the Cannon Battery Officer Course. He holds a master's degree in quality assurance engineering from Southern Polytechnic State University, Marietta, Georgia.

Clearing the Road Ahead:

The Future of Engineer Partnership in Afghanistan

By Captain Joseph J. Caperna, Captain Thomas M. Ryder, and First Lieutenant Jamal Nasir

Ten years ago, no one believed that the Afghan National Army (ANA) would possess the capability to conduct route clearance patrols, build roads, or construct buildings. Today, Soldiers of Task Force Sword have the opportunity to work with Afghan engineers who are determined to establish security for the Afghan people and prepared to meet the challenge of rebuilding their country.

As the time remaining for U.S. and coalition forces in Afghanistan dwindles, more resources are being devoted to partnership with Afghan National Security Forces (ANSF). With the drawdown of forces already being felt throughout the Combined/Joint Operations Area–Afghanistan and with more cutbacks planned, one thing is clear: the International Security Assistance Force (ISAF) will have to do more with less. With the future of Afghanistan hanging in the balance, a dire need exists for tactically and technically competent Afghan engineers to build infrastructure, ensure freedom of movement along vital roads for transportation and commerce, and secure the developing government. According to the ISAF Partnering Directive, the Afghan government must protect the Afghan population and defeat the insurgency that challenges its sovereignty. The ISAF mission is to use embedded partnering—a trust-based, habitual, and enduring relationship with the ANSF—as the method to help the government accomplish these goals.

Serving as a theater level asset, Task Force Sword is charged with synchronizing all combat and construction engineering effects through the Northern Engineer Region of Afghanistan. This region includes Regional Command (RC)–East, –North, and –Capital and spans more than 100,000

square miles. Task Force Sword is the only U.S. Army engineer brigade in theater and is composed of the following units:

- 18th Engineer Brigade, Schwetzingen, Germany.
- 54th Engineer Battalion (Task Force Dolch), Bamberg, Germany.
- 111th Engineer Battalion (Task Force Roughneck), Texas Army National Guard.
- 1249th Engineer Battalion (Task Force Gridley), Oregon Army National Guard.

The Southern Engineer Region contains RC–West, –Southwest, and –South. It is currently controlled by the 30th Naval Construction Regiment.

Significance of Partnership

"Partnership is an essential aspect of our counterinsurgency strategy. It is also an indispensable element of the transition of responsibility to Afghans."

—General David Petraeus (Retired)
Former ISAF commander

Before deploying, Task Force Sword leaders recognized the importance of partnering with ANA engineers and placed partnership as a main line of effort alongside construction and combat effects. The desired outcome for the engineer partnership line of effort, when U.S. forces depart Afghanistan in 2014, is for ANA engineer units to be able to provide combat and construction effects independent of ISAF assistance. The end state for partnership is for the ANSF to shoulder additional security tasks and conduct and sustain coordinated operations with its own operational support and sustainment capabilities and with less assistance from the coalition.

Once deployed, Task Force Sword quickly established its partnership cell as part of the operations section. Consisting of a captain and a staff sergeant on the brigade staff, the aims of the partnership cell are to—

- Increase ANSF capability and capacity.
- Help the ANSF and its leaders reach a level where they can shoulder additional security tasks and conduct coordinated operations with less ISAF assistance.
- Promote ANSF professionalism.

The partnership cell regularly hosts a working group to synchronize Task Force Sword partnership efforts with the ANA engineers in RC–East, –North, and –Capital to help the ANA engineers conduct full spectrum engineer operations independent of ISAF assistance. The working group consists of the brigade operations officer, partnership officers from the brigade and each battalion, the brigade public affairs officer, and a representative from the intelligence staff. The working group uses input from the intelligence section, the North Atlantic Treaty Organization (NATO) Training Mission–Afghanistan fielding plan of future ANA

Commander's Update and Assessment Tool

Independent

Personnel and equipment are more than 75 percent present, and the unit can meet basic logistics needs without help from coalition forces. The unit is able to—

- Plan and execute missions.
- Maintain mission command of subordinate elements.
- Summon and control the quick-reaction force and medical evacuation assets.
- Call for and integrate joint effects from coalition forces.
- Exploit intelligence.

Effective With Advisors

Personnel and equipment are no more than 75 percent present. The unit members, leaders, and staff adhere to the ANSF code of conduct and are loyal to the Afghan government. The unit is able to—

- Plan, synchronize, direct, and report on operations and status.
- Coordinate and communicate with higher, lower, adjacent, and combined/joint units.

Effective With Assistance

Personnel and equipment are no more than 65 percent present. The leaders, staff, and most of the unit members usually adhere to the ANSF code of conduct and are loyal to the Afghan government. The unit requires routine mentoring to—

- Plan, synchronize, direct, and report on operations and status.
- Coordinate and communicate with higher, lower, adjacent, and combined/joint units.
- Maintain effective readiness reports.

Developing

Personnel and equipment are less than 65 percent present. Unit leaders and most of the staff usually adhere to the ANSF code of conduct and are loyal to the Afghan government. The unit requires partner unit presence to—

- Plan, synchronize, direct, and report on operations and status.
- Coordinate and communicate with higher, lower, adjacent, and combined/joint units.

Establishing

Personnel and equipment are less than 50 percent present. Unit leaders and staff may not adhere to the ANSF code of conduct or may not be loyal to the Afghan government. The unit is at the beginning of organization and is barely able to—

- Plan, synchronize, direct, and report on operations and status, even with the presence and assistance of a partner unit.
- Coordinate and communicate with higher, lower, adjacent, and combined/joint units.

Not Assessed

Insufficient data is available for complete assessment.

engineer units, any requests from ANSF or the Afghan government, and current partnerships. The working group also examines units that have no partnership in order to close the gap. Often, the reason units lack a partnership is because ANA engineer units are still in the process of being created. One critical element of ensuring a solid partnership is sending U.S. Soldiers to the ANA engineer school in Mazar-E-Sharif while their future Afghan partnership unit is still being formed. This way, relationships and bonds can be formed even before an ANA unit graduates and joins the fight.

The partnership working group reviews key leader engagements with ANA units, analyzes the map overlay of U.S. units that have partnerships, and revises the commander's update and assessment tool as needed. The tool measures ANA units based on leadership, training, overall material, and shoot-move-communicate skills and then places them into one of the categories in the table. The working group also analyzes the security objectives for each RC while determining if partnership efforts are having the desired impact on the security objective areas.

Updated partnership priorities and planned key leader engagements with ANA units and installations are produced as outputs from the partnership working groups. After each group meeting, slides and outputs are disseminated to the strategic communications and targeting working groups so that the knowledge can be shared throughout the brigade staff and incorporated into different working groups.

ANA engineer units include—

- *Kandaks*, or battalions, which are corps level assets containing horizontal, vertical, and combat engineers.
- *Coys*, or engineer companies, that have sapper and construction assets to provide combat and force protection abilities.
- Route clearance companies (RCCs), which have less manpower than a *coy*, but include organic route clearance and explosive ordnance disposal platoons.
- Garrison support units, which are part of brigade headquarters. Similar to the department of public works on a U.S. forward operating base, they provide engineer support to facilities and process recurring work requests.

A U.S. heavy equipment operator (right) uses his translator to mentor an ANA engineer (left) during a partnership construction project.

A Task Force Roughneck engineer supervises Afghan engineer training in Balkh Province.

Partnership Success

"Our military is working hand in hand with our civilian partners to secure the gains we have made by strengthening the Afghan government and by advancing economic opportunity. We're committed to working with and strengthening our Afghan partners because we know that only they can ensure the security of their country."

—General John R. Allen
ISAF commander

Task Force Sword is involved in mentoring several ANA engineer units, including route clearance, facility, and combat engineer units. These partnerships range from basic classes in driver training to combined action route clearance operations. Regardless of the intended mission, the key to making these partnerships yield successful results is using realistic expectations and developing goals that will enable the ANA to conduct independent operations.

Great achievements have already been made through partnership. ANA combat engineers are securing main roads needed for commerce in Afghanistan. ANA construction engineers are busy repairing highways, building infrastructure, and making improvements to the quality of life.

An example of a successful partnership is that of the 2d Brigade, 203d Corps ANA Route Clearance Company with the U.S. Army 370th Engineer Company in the vicinity of Forward Operating Base Sharana. According to the 370th Engineer Company commander, the partnership is going well, with the ANA unit fully capable of conducting route clearance operations. The Afghan engineers have discovered improvised explosive devices while conducting joint missions with U.S. units, validating their route clearance skills.

The colocation of the partnered units, strong ANA leadership, and trust between Afghan and American Soldiers are key ingredients for the success of the partnership. The Afghan route clearance Soldiers volunteered to accompany critical supplies to the 370th Engineer Company, which had suffered multiple improvised explosive device strikes during an operation and was stuck at another base awaiting repair parts. One U.S. partnership officer described the "brotherhood and relationship" that had been forged by shared combat experience.

Partnership Challenges

Unfortunately, not all partnerships are flourishing. Leadership—or the lack thereof—plays a pivotal role in overall success. However, logistics, equipment, and fielding are bigger challenges than training, leadership, or competency in the ANA. Currently, some U.S. Army engineer units are not partnered with the ANA because the Afghan units have yet to be stood up, properly trained, and fielded. Additionally, not all of the newly formed ANA engineer units are colocated with their American counterparts. This significantly detracts from the partnership experience and hinders the growth of relationships. Likewise, the ANA logistics and supply systems have yet to catch up with the

Soldiers from Task Force Gridley and an ANA route clearance company work together to clear a route in Paktika Province.

influx of new units being created. The slow progress makes it tempting to give the ANA a handout, but U.S. and Afghan leaders are seeking long-term solutions.

"Our hope is that the U.S. forces develop and build the ANA and Afghan National Police so that we can defend our own country. I don't want the U.S. and coalition forces to solve our problems for us. I want the U.S. to solve the bureaucracy and logistics issues so [we] can help ourselves," said an ANA officer. He added that the lack of education makes Afghans susceptible to influence from insurgents and that the first step in ANA training should be education and literacy.

The Way Ahead

Three lines of effort—engineer partnership, construction effects, and combat effects—continue to develop ANA engineers toward independent operations. Task Force Sword spent the first 60 days of its deployment focusing on key leader engagements with all currently fielded ANA engineer units, training facilities, and units in training. By building relationships from platoon to brigade level, Task Force Sword developed or grew established partnerships.

After 90 days in theater, Task Force Sword assessed all training facility programs of instruction and the engineer units undergoing training. This step validated the timeline for partnered operations to ensure that task force goals and milestones were feasible. The next step was to conduct commander updates and assessments of all partnered ANA engineer units to determine each unit's leadership, readiness posture, and ability to conduct missions. The next ongoing step will be to ensure that all ANA engineer units are fielded and partnered with a NATO unit. If possible, the NATO units will embed with their partnered ANA unit. Partnered NATO and ANA units are colocated when feasible.

After training and mentorship with partnered units, Task Force Sword began to conduct combined action with the ANA engineers. Certain ANA units require more time and training before they are ready for combined action. Additionally, as new ANA units are formed, engagements and training must occur before conducting combined action. Currently, Task Force Sword is in the process of improving the operational readiness of all partnered ANA units so that they are capable of combined action. Ultimately, the goal is to build the ANA through combined action until they can conduct independent operations. Before conducting independent operations, ANA engineers will be assessed and validated by their U.S. or NATO partners.

It is impossible to plan a partnership with the ANA in a sterilized environment. Afghans depend on personal contact, which develops relationships and yields great rewards. Liaison or partnership officers who take the time to know their Afghan counterparts set themselves up for success. U.S. Soldiers must look for commonalities with the Afghan people and respect the differences between the two cultures. To build rapport, U.S. Soldiers must trust their Afghan counterparts. The future of engineering partnership is for the U.S. Army and the ANA to work *shohna ba shohna*, or "shoulder to shoulder," in pursuit of common mission success.

Captain Caperna is the 18th Engineer Brigade ANSF development officer. He holds a bachelor's degree in psychology from Hofstra University in New York and is a graduate of the Engineer Officer Basic Course.

Captain Ryder is the 18th Engineer Brigade public affairs officer. He holds a bachelor's degree in engineering management from the U.S. Military Academy and a master's degree in engineering management from Missouri University of Science and Technology. A graduate of the Engineer Captains Career Course, he is an intern engineer in New York.

First Lieutenant Nasir is the commander of the explosive ordnance disposal unit attached to the 2d Brigade, 203d ANA Route Clearance Company. He has attended the Afghan Military School and the Military University in Kabul.

Success in Partnership

By Captain Mark D. Gillman

For any route clearance company or maneuver unit that will partner with a foreign army unit, we offer our strategy and lessons learned, build a relationship of trust, create consistency, and demand progress toward self-sufficiency. This article describes how A Company, 4th Brigade Special Troops Battalion, 4th Brigade Combat Team, 101st Airborne Division, built on these pillars to form what was called "the most successful partnership in Afghanistan."

U.S. junior leaders conduct gunnery with their ANA counterparts. Partnership at the lowest levels contributed to the success of the team.

Background

The roads in Paktika Province are mostly unpaved, unimproved, and laden with improvised explosive devices (IEDs). These devices serve as a powerful deterrent to travel by military vehicles. This explains the need for route clearance packages, specially equipped combat engineer platoons trained to find and neutralize these explosive obstacles.

After 5 months of route clearance operations in Paktika, our company mission changed to one of partnership. The primary task was to train the route clearance company (RCC) of the 2d Brigade, 203d Corps of the Afghan National Army (ANA). With little more information than an address in Kabul where

One of the explosive ordnance disposal teams embedded in each ANA route clearance platoon takes part in an IED removal exercise.

the ANA unit basic course was underway and the simple guidance to "train the ANA," we began our preparations.

We first conducted a leader's reconnaissance that included the commander, first sergeant, squad leaders from our two route clearance packages, and an interpreter. We visited the soldiers of the RCC two weeks before their graduation, observed their training, met with their commander, inspected their equipment, and quizzed the contracted trainers on their curriculum. We learned that there is already a decent draft field manual (also available in the Dari language) that describes the training methodology, task organization, equipment, and primary duties of an RCC. It provides the trainers, partners, and ANA leaders a common understanding of what to expect. The trainers are excellent, have relevant experience with IEDs in Afghanistan, and operate a finely articulated, 14-week training schedule. We also learned that their equipment included M1151 advanced armament carriers, Panama City mine roller systems, and dismounted metal detectors. Finally, we learned that there were still many issues to address before the new unit would be mission-ready. We gathered enough information to determine that we would build a relationship of trust and consistency and promote self-sufficiency from the very start.

Building Trust

Trust underpins partnership. By providing their life support, getting to know them as people, and being honest and direct about issues, we gained the trust of the ANA soldiers and, thus, their loyalty on the battlefield. Soldiers moving to a new place worry about where they will sleep, what they will eat, and what amenities will be available. When the RCC soldiers moved into their containerized quarters at Forward Operating Base Sharana, their fears abated. Our entire company greeted them at the gates of their new home on the day they arrived. Being colocated with their U.S. partners, they had a lifeline when problems arose, whether plumbing, electrical, or medical. That first day, we declared that we would help them get settled, train them as best we could, and fight alongside them as brothers. Our assistance made them willing and able to go on missions with us from the very first week.

We also took the time to get to know them as people. It is not only Afghan soldiers who are skeptical about working with foreign armies; U.S. Soldiers also have questions about missions and how much to trust the foreign soldiers. It was important to dissolve some of these barriers, so we held a barbecue the first week and invited every interpreter we could find. The members of both armies met, talked, threw a football around, and let their guard down a bit. We also enrolled every RCC soldier into our biometric system. This helped them get badges for easy access to our base and helped us develop a picture book. The book, organized by platoons and vehicle crews, helped Soldiers remember who everyone was and endeared us to our Afghan partners when we called them by name. We also learned their calendar system and coordinated all missions based on the Afghan solar

Combined clearance formations included an interpreter with a headset to relay information.

calendar rather than forcing them to adjust to our system. (It is currently the year 1390 on that calendar.) Finally, we were sensitive to their faith, accommodating their prayer times even when on patrol. Their commander later told us that the most disparaging lies spread by the insurgents about Americans was that we did not allow ANA soldiers to practice their religion. When this proved untrue, we won over many whose loyalty had been divided.

Knowing their names, respecting their customs, and showing support opened the door for honest communication. U.S. Soldiers worried about getting shot in the back because of numerous similar incidents around the country. The ANA soldiers worried that the Americans would abandon them in a firefight because of earlier experiences with other U.S. partners. They also questioned why we would withhold our seemingly limitless assets from them when we knew that they had no support—including vehicle maintenance, fuel, and other necessities—from their higher headquarters. We discussed these and other issues openly and directly to try to understand each other. While we could not always resolve issues immediately, we reduced the friction by talking about them rather than ignoring them. Because we had trust, we could look past these issues and continue doing missions together as a team.

Striving for Consistency

Our second focus was to strive for consistency in task organization, attitude, and battle rhythm. We hoped to avoid the plight of RCCs deployed elsewhere in the country, many of which had been turned to other purposes. Some were dismantled and turned into personal security detachments for Afghan generals, some were designated as gate guards or warm bodies to fill details at headquarters, and others had devolved into single platoons rather than companies because so many assigned soldiers were absent without leave, tasked out, or on leave. We started with three RCC platoons and were determined to keep them all functioning as such. The key was to keep their platoon organization intact, maintaining ANA leadership of ANA soldiers. By building habitual relationships between platoons and combining U.S. and ANA platoons into teams, members got to know their counterparts. It also clarified who would be going on which missions.

We learned from the civilian trainers in Kabul how important consistency is in Afghan culture. We took our cue from the trainers, who kept the same cadre teams with the same classes for the duration of the course and made daily schedules predictable. When the RCC deployed from Kabul to Forward Operating Base Sharana, several of the same U.S. Soldiers who had performed the earlier leaders' reconnaissance escorted the ANA soldiers to their new quarters. "Leo," one of the trainers from Kabul, lived with our unit for a few weeks to further ease the transition. His relationship with the ANA gave him the credibility to explain to them some things about the U.S. Army. Leo was also able to describe some of the key personalities and dynamics of the RCC to us and mentor us on cultural dos and don'ts. His presence during the formative weeks of our partnership set us up for success.

Establishing a Battle Rhythm

Establishing a good battle rhythm also helped. One example was the after action review conducted immediately following every mission. It became an opportunity for each side to reflect, ask questions and, sometimes, vent after stressful patrols. To improve their

Afghan route clearance equipment

readiness posture, we made it mandatory for the ANA to refuel before they parked their vehicles after operations. We mandated daily contact with each platoon and brought all platoon leaders, platoon sergeants, and U.S. and ANA company leaders together for weekly dinners. These events kept all route clearance teams in Paktika—American and Afghan—"giving way together."

Fostering Self-Sufficiency

We were determined to build independence by emphasizing maintenance and trying to use ANA logistics channels first, demanding effort from the ANA before we provided anything. Self-sufficiency is purportedly the desired end state of all partnerships theater-wide. Unfortunately, it is frequently ignored in the name of expedience. Like the line between help and welfare, there is only so much assistance you can provide before dependency is created. On the other hand, missions cannot be run with empty bellies, empty fuel tanks, and broken vehicles. Support must come from somewhere, and the ANA system was not always adequate. Thus, a balance had to be struck.

First, we sought to understand the ANA logistics network. The RCC was task-organized as a "separate company," reporting directly to their brigade commander. While this relationship was effective for command, it was poor for support. Having no battalion level assistance put the RCC at a severe disadvantage compared to other maneuver units, which have staffs and field grade commanders responsible for their well-being. We continued to provide material support for items such as fuel until the ANA logistics system began to function more effectively.

For parts and equipment shortages, we insisted that the RCC submit paperwork to the Ministry of Defense for everything they required. This paperwork represented the Afghans doing all they could do to help themselves. We also spent a lot of time training the Afghans on the care of equipment, including vehicle preventive maintenance, weapons maintenance, special equipment maintenance, and driver training. Providing small items such as weapon oil made their maintenance more productive. A windfall of vehicle parts allowed us to give them what they needed while waiting for their Ministry of Defense requests to be filled.

Results

When a combined patrol came under attack by an IED and small arms fire, our lead gun truck was destroyed. Soldiers from the RCC quickly dismounted, returned fire, and maneuvered on the hasty ambush position the enemy occupied. They were quick enough to capture two motorcycles and several weapons and magazines. After one of our vehicles took an IED strike during another patrol, the RCC Soldiers dismounted with mine detectors to search for secondary IEDs even before their help was requested. By the end of our 6 months together, we had progressed to the point that any of the RCC platoons could effectively partner with any of our platoons on any given mission. We conducted more than 100 combined patrols, improved our IED find-to-strike ratio from 33 percent without the ANA to 73 percent with them, and observed as they conducted more than 20 operations without U.S. assistance. The achievements of this U.S.-Afghan route clearance team were widely recognized by leaders of both nations, most notably by Lieutenant General Sher Mohammad Karimi, Chief of Army Staff in the Military of Afghanistan. During a visit to the brigade headquarters, he commended the RCC commander and dubbed us "the most successful partnership in Afghanistan."

Captain Gillman is the commander of Alpha Company, 4th Brigade Special Troops Battalion, 4th Brigade Combat Team (Currahee), 101st Airborne Division (Air Assault). He graduated from the U.S. Military Academy in 2004 and holds a master's degree from Missouri University of Science and Technology at Rolla.

Team Muhandis:

Building Great Iraqi Army Engineers

By Major Jason L. Buursma and Captain Thomas G. Fitzpatrick

The Road to a New Dawn

Throughout Operation Iraqi Freedom and Operation New Dawn, U.S. and coalition forces worked to develop an Iraqi Army engineer force capable of supporting and defending the sovereignty of Iraq. These efforts built on years of work by officers and noncommissioned officers from all services and coalition partners. Australia, in particular, contributed significantly to the training effort throughout Operation Iraqi Freedom. For several years, the Australians provided an engineer officer to serve as the officer in charge of Team Muhandis (Engineer), the Multinational Corps–Iraq engineer section advising Iraqi Army engineers. These field grade officers served 6-month tours, advising Iraqi Army engineer senior leaders and synchronizing efforts and information with subordinate engineer brigades and military transition teams.

In early 2011, the XVIIIth Airborne Corps assumed responsibility as part of U.S. Forces–Iraq (USF-I) to complete Operation New Dawn. The USF-I joint engineer staff (J-7) worked to enable a trained and equipped Iraqi Army engineer force to support the internal and external defense of the country. Team Muhandis led the J-7 efforts in this strategic mission by—

- Conducting key leader engagements with the Joint Headquarters Military Engineering (M10) Directorate and Iraqi Ground Forces Command (IGFC) engineers.
- Synchronizing engineer training efforts across multiple Iraqi organizations.
- Providing oversight of new equipment fielding to build engineer capability.

Team Muhandis devised a targeted approach to build Iraqi Army engineer capability. The team developed the following three focus areas to enable a minimum-essential capability as the end of the mission approached:

- Route clearance.
- Sustainment.
- Bridging.

Route Clearance Capability

Team Muhandis coordinated with division engineers, division level cells training Iraqi Security Forces (ISF), and the 20th Engineer Brigade to synchronize partnership efforts and track the progress of route clearance capability. The team also worked with the Iraqi Training

Soldiers from the 1st Cavalry Division train soldiers from the 14th Field Engineers Regiment to operate the interrogator arms of their light armored vehicles.

and Advisory Mission and the M10 directorate to speed up the fielding of 45 Iraqi light armored vehicles to fill shortages in Iraqi Army route clearance teams. This combined training and resourcing effort led to a significant increase in qualified route clearance teams across Iraq. With the drawdown of forces, U.S. forces had fewer military transition teams and partnering units available to track ISF engineers, making it difficult to track the activities of each Iraqi Army field engineer regiment.

Team Muhandis coordinated with the IGFC engineer staff to refine weekly and monthly reports to include information useful to U.S. forces. This let the IGFC see its engineer capabilities more clearly and provided good situational awareness for U.S. forces. The added detail also led to an increased emphasis on route clearance. In some cases, Iraqi engineer units refused to conduct missions with their U.S. engineer partners. This was often resolved by the IGFC simply issuing a directive to the Iraqi unit to conduct partnered operations. Team Muhandis also initiated a weekly online meeting with division engineers and 20th Engineer Brigade staff officers to discuss issues common to many Iraqi Army engineer units. Team Muhandis was then equipped to provide feedback to the IGFC and the M10 and to influence Iraqi Army command emphasis to resolve problems.

Sustainment Challenges

Sustainment continues to be a challenge for Iraqi Army engineers as their logistical and maintenance system suffers from a variety of long-standing problems, from the unit to the national level. In early 2011, the Iraqi Army engineer depot level repair facility was merely a building without power or equipment and had only a few Soldiers present to manage operations. Team Muhandis influenced key Iraqi Army leaders to put greater emphasis on developing and strengthening national-level engineer sustainment units. A competent new Iraqi Army commander was placed in command of the repair facility, and the operation moved to a building suitable for depot level repairs. Team Muhandis also helped the unit correct critical deficiencies, including—

- Mechanic training.
- Power generation.
- Shortage of repair parts.
- Shortage of equipment such as tool kits and vehicles.

Iraqi light armored vehicle maintenance specialists train Iraqi mechanics.

> ***"Team Muhandis influenced key Iraqi Army leaders to put greater emphasis on developing and strengthening national level engineer sustainment units."***

The team coordinated equipping solutions through the Iraqi Training and Advisory Mission, but also discovered that Iraqi Army engineers could help themselves with many of their challenges. The M10 directed that two Iraqi Army engineer sustainment units be relocated to Contingency Operating Site Taji, where other national engineer assets were located. In many cases, one unit had excess items that were a shortage in another unit. Team Muhandis and the 20th Engineer Brigade facilitated meetings and coordination between different engineer units to cross-level resources. The units benefited, and U.S. advisors could build capacity faster in under-resourced units.

Military Bridging Training and Equipping

The 20th Engineer Brigade was tasked to build Iraqi Army bridge capability. The brigade dedicated a full-time team, plus trainers from the 74th Multirole Bridge Company, to help transform the Iraqi Army Strategic Bridge Company (originally organic to the Headquarters Field Engineer Regiment) into a Headquarters Bridge Regiment. This action required extensive assistance and coordination with Iraqi Army engineer leaders to resolve manning, equipping, and facility issues. The most difficult task was advising and assisting the transfer of personnel and equipment to support the transformation. Once the major issues were resolved, Soldiers from the U.S. bridge company trained the Iraqi unit on the emplacement of the assault float bridge, Mabey-Johnson bridge, and medium girder bridge. They also trained operators on bridge support equipment.

The equipping effort required extensive coordination between U.S. and Iraqi Army leaders. The USF-I staff clarified procedures as equipment was transferred to the Iraqi

(Continued on page 27)

Soldiers from the 74th Multirole Bridge Company teach Iraqi Army soldiers to employ a bridge across the Tigris River.

Engineer Civil Action in Cambodia

By First Lieutenant Peter M. Friedewald

In spring 2011, Soldiers from the 544th Engineer Company, 52d Engineer Battalion, traveled to Cambodia to participate in Operation Angkor Sentinel 2011, a multinational training exercise sponsored by U.S. Army Pacific and the Royal Cambodian Armed Forces. The exercise, led by the 204th Maneuver Enhancement Brigade, Utah Army National Guard, included U.S. Navy Seabees and participants from the Mongolian and Indonesian armed forces. The exercise included an engineer civil action project, a medical civil action project, and a command post exercise. The ultimate goal of the exercise was to increase the capabilities and professionalism of the developing nations' militaries while strengthening the bonds between our countries.

The 40-Soldier element from the 544th Engineer Company spearheaded the engineer civil action project. The 544th is a vertical engineer company composed of Soldiers with a variety of skills, including concrete and masonry specialists, carpenters, plumbers, and electricians. Surveyors, heavy equipment operators, and welders from throughout the 52d Engineer Battalion also joined the team to enhance construction capabilities. Soldiers of every military occupational specialty represented helped ensure the success of the project.

The engineer civil action portion of the exercise consisted of two projects in Kampong Speu Province, southeast of the capital city of Phnom Penh. The 544th Engineer Company Soldiers constructed a primary school facility and performed major renovations on a rural medical clinic. Both projects were enhanced by Seabees, who placed and improved wells for the facilities and surrounding villages.

Photo by Staff Sergeant Whitney Houston

Children greet 544th Engineer Company Soldiers on their way to the jobsite.

School Construction

Construction of the Pothivong Primary School was a significant undertaking. In the span of 8 weeks, 544th Soldiers turned a 6-hectare swath of jungle into a walled compound containing a 9- by 27-meter, three-room schoolhouse, a three-stall latrine building with a septic tank and leach field, a well, and a playground. The structures were built in the Cambodian style of reinforced concrete, column-and-beam framework and finished with locally made clay bricks, interior and exterior cement stucco finish, and interlocking concrete roof tiles. The school now serves 120 local children who previously could not attend school or had to walk or ride a bicycle more than 3 miles to the nearest facility.

The American and Cambodian contingents brought their individual strengths to the project. Early on, 544th Soldiers contributed their skills and expertise in concrete operations, placing more than 80 cubic meters of concrete in the footers and monolithic foundation. The Americans demonstrated

Photo by Specialist Derek Schopps

Soldiers guide a section of five trusses as a crane lifts it onto the schoolhouse roof.

their very high standards for timber formwork to the Royal Cambodian Armed Forces engineers and instructed them on how to mix concrete to achieve maximum strength. The Cambodians proved to be highly adept at fabricating rebar cages, laying bricks, and applying stucco wall coatings and accents. Most of the tools used were locally purchased and were much more rudimentary than those the U.S. Soldiers were accustomed to using. The Cambodians used tools such as simple levers, water levels, and intricate rebar bending jigs made from scrap wood and nails with great skill and ingenuity. Throughout the project, both contingents learned from each other and adapted new techniques, lending the effort efficiency and momentum.

The most significant challenge of the school project came after a major design flaw was identified in the plans, which called for a reinforced concrete roof ridge beam to span 8 meters over each classroom while supporting the weight of the roof system. Based on their construction experience, 544th leaders determined the design to be unsound and

Photo by Staff Sergeant Whitney Houston

A Cambodian soldier applies cement stucco to a classroom wall.

Photo by Staff Sergeant Whitney Houston

American and Cambodian engineers work together to lift rebar into place.

unsafe. Dissatisfied with the Cambodian head engineer's alternatives, U.S. project leaders developed a new plan to build a truss system. The trusses had to be made of steel, since available lumber was of poor quality and American-style timber trusses would lack longevity in the Cambodian climate. At this point in the project, the diverse skill sets of the U.S. team members became mission-essential. Welders from the Forward Support Company, 52d Engineer Battalion, welders from the Cambodian contingent, and a handful of vertical engineers worked around the clock for 9 days to fabricate, join, and place the 31 trusses, roof purlins, and fascia. The truss system was a great success; and as a result, the school is a very sound, high-quality structure.

Clinic Renovation

For their second project, 544th Soldiers renovated a dilapidated rural clinic. The clinic, staffed by a physician and a single nurse, provides rudimentary medical care to about 500 villagers. The renovation included the replacement of more than 2,400 concrete roof tiles, extensive painting, and the installation of a gravity-fed plumbing system. Battling "project creep" was a challenge during this project. The plumbing system was in serious disrepair, and the removal of the existing roof tiles exposed rotting timber. These challenges provided an excellent unexpected opportunity for carpenters and plumbers to practice their trades.

While it was rewarding to the Soldiers to dramatically improve the clinic facility, the project was also beneficial because of the community involvement

Photo by Staff Sergeant Whitney Houston

A 544th Engineer Company medic treats a Cambodian girl in a village near the jobsite.

at the site. One of the unit medics, a licensed practical nurse, helped deliver several babies and treated local children for burns, infections, and other minor ailments. In one instance, he undoubtedly saved the life of a child suffering from tetanus. The experience left a lasting impression on the Soldiers who worked on the project.

Lessons Learned

Construction Meetings. Daily construction meetings were extremely important. These meetings were initially very frustrating due to the language barrier, different construction management styles, and incongruent time and material estimations. Royal Cambodian Armed Forces leaders were hesitant to contribute during these meetings at first; but as the project progressed, the meetings became easier and more productive. Good communication was a necessity.

Contracting. Before deployment, the 544th Engineer Company trained multiple contracting officer representatives. Establishing a good relationship with the contracting officers and going into the project with personnel who understood the requirements, methods, and limitations of the contracting process allowed the unit to procure materials and equipment in a timely manner. Effective contracting allowed the 544th to make the major, unanticipated design changes that the project demanded.

Reachback. Although leaders were able to overcome a major roof system design flaw and produce a sound and safe structure, a great deal of stress, effort, and risk could have been avoided by leveraging the capabilities of U.S. Army Corp of Engineers reachback programs. Units should identify reachback programs and communicate with U.S. Army Corp of Engineers subject matter experts throughout the planning and execution phases of construction. The U.S. Army Corps of Engineers Reachback Operations Center can be reached at <*uroc@usace.army.mil*> or 1-877-ARMY-ENG. Their Web site address is <*https://uroc-redi.usace.army.mil/default.aspx*>.

While the Angkor Sentinel 2011 civil action projects provided an excellent, diverse construction training opportunity for the 544th Engineer Company, the best thing about the mission was the community involvement. Soldiers traveled to and from the jobsite every day through crowds of smiling children who were immensely grateful for the hard work put into the projects. Missions such as this one, sponsored annually by U.S. Army Pacific, provide a welcome change of pace for engineer Soldiers who have thus far spent the deployed portions of their careers in combat zones. Angkor Sentinel 2011 was a wonderful opportunity to help people and support international peace and cooperation.

First Lieutenant Friedewald is a platoon leader in the 544th Engineer Company and was the project officer in charge.

("Team Muhandis" continued from page 23)

Army under a number of different programs, each requiring a unique process. The staff work was complicated but necessary to properly equip the Iraqi Army engineers.

The 20th Engineer Brigade provided premier training to Iraqi Army engineers, who learned quickly but had high rates of turnovers and transfers. Iraqi and U.S. leaders were concerned about the loss of trained bridging personnel, so the 20th Engineer Brigade worked with the Iraqi Army Engineer School to provide bridging instructors and equipment. By ensuring that bridge instructors and equipment were built into the generating force, they set the conditions for long-term training proficiency in the operating force. These trainers will be essential to the Iraqi Army as it works to expand its bridging capacity from a company to a regiment.

The Way Ahead

Future advisors at the national level can replicate some of our successes by facilitating communication across all advise, train, assist, and equip elements through conducting informal coordination meetings; receiving issues from the lower echelons; and facilitating solutions through the national headquarters. The advisors can help Iraqi Army units help themselves by facilitating communication and coordination between units and ensuring that additional capabilities are resourced in the operating and generating forces. Finally, senior U.S. leader involvement is critical to make these efforts succeed.

Throughout 2011 and Operation New Dawn, Iraqi Army engineers demonstrated significant progress, specifically in the areas of route clearance operations, engineer sustainment, and logistical support bridge emplacement and repair. Going forward, they must continue to support internal security operations while training to defend their country against external threats, thus enabling a more stable, sovereign, and self-reliant Iraq. The future of Iraq is in their hands.

Major Buursma served in a variety of positions, including Team Muhandis officer in charge, during Operation New Dawn. He also served as an Iraqi Army field engineer regiment advisor, 2008–2009. He holds a bachelor's degree in computer science from Wheaton College and a master's degree in engineering management from the University of Missouri–Rolla (now Missouri University of Science and Technology).

Captain Fitzpatrick served in a variety of positions, including IGFC engineer liaison officer, during Operation New Dawn. He also served as a route clearance platoon leader and company executive officer, 2006–2007. He holds a bachelor's degree in biology from East Carolina University and a master's degree in engineering management from Missouri University of Science and Technology.

ENGINEER BRIGADE VALIDATES WITH MOBILE TRAINING TEAM

By Sergeant Major David G. Crews, Staff Sergeant Donald J. Keeney, and Staff Sergeant Rory S. Seppanen

Today's nonlinear battlefield is fluid and changes rapidly, requiring Soldiers to adapt quickly. Tactics, techniques, and procedures (TTP) sometimes change faster than stateside training can support; and equipment may become obsolete before it is even used. As the U.S. Army refines its TTP, adversaries adjust their own TTP to counter ours. Mission success depends on understanding and using the capabilities of the combined arms set available in theater.

When Soldiers of the 1014th Engineer Company, Puerto Rico Army National Guard, prepared for deployment, they completed their validation exercise at Fort McCoy, Wisconsin. However, their training did not fully address engineer-specific mission sets for the route clearance missions they would be conducting. Also, they established their area of operations in Regional Command North and had no unit with which to conduct relief-in-place training—to include local TTP—before taking control of the area. Consequently, they called upon their future higher headquarters, the 111th Engineer Battalion (Task Force Roughneck) and the 18th Engineer Brigade (Task Force Sword), to develop a plan to fill the gap in training and validate the unit before receiving mission sets.

Task Force Sword fielded a mobile training team (MTT) to train and validate the newly arrived engineer unit. The MTT traveled throughout the North Engineer Region (composed of Regional Commands–East, –North, and –Capital) to Forward Operating Base Deh Dadi II to conduct phased individual and collective training on current equipment, threats, and operational knowledge for a route clearance company. After conducting a mission analysis, Task Force Sword pulled experienced personnel to support the MTT mission.

Task Force Sword staff identified the training needs of a route clearance platoon and the 1014th Engineer Company. The training plan consisted of two phases: prerequisite training and on-site training, both of which could be conducted by the MTT. Prerequisite training is normally conducted at the mobilization station before mobilizing and during the first 2 weeks after arrival in country. All remaining training is normally conducted during the relief-in-place process, which the 1014th Engineer Company did not have. The prerequisite training included—

- Explosive ordnance clearance.
- Ground-penetrating radar.
- Weapons intelligence team operations.
- Route reconnaissance and clearance.
- Puma™ man-portable, unmanned aerial vehicle operations.

Task Force Sword ordered Task Force Roughneck's sister units to provide their best route clearance Soldiers for the MTT. All Task Force Sword units provided experts in a variety of enabler positions, while assuming short-term risk

in their own units by not having their most skilled Soldiers available for missions. These Soldiers gave classes on topics that included—

- Troop leading procedures.
- Recovery of disabled vehicles.
- Common remotely operated weapon station operations.

The MTT plan used the standard crawl-walk-run training cycle. During the crawl phase, Soldiers learned individual tasks such as the operation of handheld improvised explosive device detection equipment. In the walk phase, they moved to collective training that included medical evacuation operations and combat TTP. The run phase concluded with trainers conducting a right-seat/left-seat ride to validate Soldiers for day and night operations.

To prepare, Task Force Sword sent an advance team to ensure that the training areas were prepared and that all needed equipment was on site. Each of the route clearance platoons had to work closely with maintenance contractors to overcome mechanical and communications problems to get critical pieces of equipment fully mission-capable for the right-seat/left-seat ride. The engineer equipment officer and maintenance officers from Task Force Roughneck and Task Force Sword ordered the needed parts, which quickly arrived to support the mission. The teamwork successfully brought equipment up to standard before the company validation.

During setup for the training, the MTT identified other issues, such as missing equipment. Task Force Sword Soldiers located and reallocated equipment to make the 1014th Engineer Company combat-ready, and the items were shipped to the training area on the same day. As the advance team ensured that all the necessary equipment was available, Task Force Sword continued to coordinate with external units so that the widest range of applicable training and experience was available.

In order to train for the combined arms fight, the Task Force Sword liaison to Regional Command–North coordinated with the area of operations owner to train the integration of infantry assets, including human intelligence, mortars, artillery, and air weapons teams. Although these combat multipliers are taught in many leadership schools, applying them to combat scenarios needs to be taught for the specific area of operations and the combat multipliers available. During the training, Soldiers learned about the combat multipliers and also about aspects they would have to integrate into plans. For instance, they learned that they would not always be the top priority in the area of operations and that some fire support officers won't order fire missions unless a trained observer is on site. One solution proposed was to ask for fire support officers during mission coordination and integrate them into the route clearance platoon. Leaders were surprised to learn that if they asked for the support during the mission planning, there was a variety of available firepower, even if they were not a top priority. Involving combat multipliers during the planning and execution phases maximizes the ability of the route clearance platoon to operate and sets everyone up for success.

External support from communications experts resulted in technical inspections and training on communications equipment, instruction from an explosive ordnance disposal team taught the weapons intelligence team about site exploitation for key leaders, and North Atlantic Treaty Organization units assembled improvised explosive device training aids for practical exercises, adding realism to the training without hazard to the Soldiers as they practiced interrogation techniques. Synchronizing the combined arms fight is a challenge; but when done correctly, it can bring a lot of firepower to the fight.

To begin the training, the MTT gauged the level of training that Soldiers had received on individual tasks, including—

- Counter remote control improvised explosive device electronic warfare (CREW) systems.
- Mine detection operations.

A Soldier from the 515th Engineer Company instructs 1014th Engineer Company Soldiers on the proper use of improvised explosive device detection equipment.

- Common remotely operated weapon stations.
- Route clearance optics suite.
- Casualty evacuation.
- Helicopter landing zone selection.
- Medical evacuation.
- Communications.
- Actions on contact.
- Escalation of force.
- Vehicle recovery operations.
- Troop leading procedures.
- Precombat checks.
- Precombat inspections.

This identified the requirements for the training, allowing the MTT to assign subject matter experts for each task.

The crawl, or individual training, phase began with 5 days of round-robin training on the focus areas identified earlier. Instructors were flexible and adapted to a variety of training areas. This training lasted 6 to 8 hours daily. By the end of this phase, all Soldiers in the company were able to operate the given equipment.

The walk, or collective training, phase was an additional 5-day cycle that applied the classroom instruction on the battlefield. The first day of the phase for Soldiers in pay grade E-5 and below consisted of each route clearance platoon walking through a lane of scenarios focused on using all available techniques to find various improvised explosive devices. This allowed trainers to judge how well Soldiers had received the knowledge they had been given the week before. The route clearance platoons performed day and night operations on the second day, with 4-hour blocks of activity and a review conducted after each scenario. The reviews increased the benefits by letting Soldiers learn from mistakes. Day three of collective training repeated the earlier day and night operations, using the previous day's reviews to adjust techniques.

During the first 2 days of the walk phase for leaders, Soldiers in pay grade E-6 and above enhanced their abilities to perform tasks such as the following:

- Call for fire.
- Request close air support.
- Conduct weapons intelligence team tasks.
- Practice leadership skills.

The separate training became an issue when the platoon leaders returned to their units, having missed the route clearance training conducted for lower enlisted platoon members. One solution would be for leadership training to take place when it would not interfere with leader involvement in platoon training. If time constraints will not allow that, leaders should at least observe route clearance platoon operations before returning to leadership roles.

The run, or mission, phase consisted of route clearance platoons conducting small missions. This phase began what would normally be covered during the relief-in-place/transfer-of-authority process or during the right-seat/left-seat ride. Soldiers continued to refine the information received during the previous phases and conducted unmanned aerial vehicle operations. On the second day of the run phase, the route clearance platoons moved into the left seat, while their trainers moved into the right seat. Throughout this phase, each route clearance platoon had a dedicated trainer to oversee operations and advise platoon sergeants and platoon leaders as needed. For 6 days, the platoons operated on alternating days, giving Soldiers time to conduct training and adjust to review comments, conduct maintenance, and perform troop leading procedures. Platoon leaders independently executed their final mission with little or no guidance from the MTT.

The overall training assessment was high. Soldiers got hands-on experience that can only come from combat experience. Classroom teaching was collectively applied in realistic scenarios that let Soldiers apply tactical and technical experience not covered in earlier training. The training clarified current Army doctrine and the ever-changing enemy TTP. The phrase "we did it this way in Iraq" was frequently repeated, revealing an obsolete mind-set that hindered training. Although people tend to equate Iraq and Afghanistan, the cultures are different, the enemies are unique, and the wars are executed in drastically different ways. Enemy TTP and the technologies involved are different. Soldiers must remember that this is an evolving battlefield. During the training, the MTT saw the route clearance patrols come together, fall apart, and rebuild again into a functioning route clearance package.

Regardless of the role that each person played within the mission, as trainee or instructor, the MTT validated essential requirements for combat operations. The MTT purpose—to train route clearance platoons in every aspect of the job, while mitigating risk and better preparing Soldiers to conduct their jobs safely and effectively—was successful.

Sergeant Major Crews is the 18th Engineer Brigade operations sergeant major, currently deployed in support of Operation Enduring Freedom. He is a graduate of the U.S. Army Ranger School and the Sapper Leader Course.

Staff Sergeant Keeney is deployed to Afghanistan for the fourth time in 7 years, serving as the 18th Engineer Brigade electronic warfare noncommissioned officer in charge. He is working toward a degree in general studies.

Staff Sergeant Seppanen is the 18th Engineer Brigade future operations noncommissioned officer in charge, currently deployed in support of Operation Enduring Freedom.

Engineer Doctrine and Doctrine 2015

By Lieutenant Colonel Sinlan Morrow

Doctrine 2015 is a Department of the Army initiative to streamline Army doctrinal manuals so there will be fewer—but better-written—manuals that will be relevant and can be updated to reflect today's operational environment. It creates five separate categories of publications. Four of the categories are doctrinal publications. Technical manuals (TMs), found in the fifth category, are general subject manuals, departmentally approved by the U.S. Army Engineer School commandant. TMs will continue to drive doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) domain requirements. In October 2011, Army Doctrine Publication (ADP) 3-0, *Unified Land Operations*,[1] was published, signifying the official transition to Doctrine 2015.

Army Doctrine Publications

ADPs will contain only fundamental principles and are limited to 15 pages in a 6- by 9-inch book format. As of this writing, the U.S. Army Combined Arms Center, Fort Leavenworth, Kansas, has identified 15 ADPs. ADP 1, *The Army* (replacing Field Manual [FM] 1-0, *Human Resources Support*[2]) and ADP 3, *Unified Land Operations* (replacing FM 3-0, *Operations*[3]) are the only two publications considered to be Army "capstone" manuals.

Army Doctrine Reference Publications

Army doctrine reference publications (ADRPs) provide detailed explanations of the principles contained in the ADPs. There should be only one ADRP for each ADP. These publications are limited to 75 to 100 pages and must contain only the details that explain the principles in the ADPs.

Field Manuals

FMs will contain tactics and procedures. There will be no more than 50 Army FMs. FM 3-34, *Engineer Operations,*[4] will be engineer-led. FM 3-34 was published in August 2011 and will undergo another revision to align it with ADP/ADRP principles. All ADPs and ADRPs should be published by October 2012.

Army Techniques Publications

Army techniques publications (ATPs) describe techniques that are nonprescriptive ways or methods to perform missions, functions, or tasks. The life expectancy for ATPs is 5 to 10 years. The Engineer Regiment is responsible for 13 ATPs:

1. *Explosive Hazard Operations.*
2. *Engineer Operations—Brigade Combat Team and Below.*
3. *Engineer Operations—Echelons Above Brigade Combat Team.*
4. *Survivability.*
5. *Combined Arms Mobility.*
6. *Combined Arms Countermobility.*
7. *General Engineering.*
8. *Geospatial Engineering.*
9. *Engineer Reconnaissance.*
10. *Brigade Special Troops Battalion.*
11. *Environmental Considerations.*
12. *Combined Arms Counter Improvised Explosive Device Operations.*
13. *Base Camps.*

An important feature of an ATP will be the ability of the engineers to provide relevant feedback via the "milWiki" Web site at <*https://www.milsuite.mil/wiki/Portal: Army _Doctrine*>. All milWiki publications are unauthenticated and should only be used by the field to make recommended changes to them. This is your opportunity to make a contribution. These comments will be reviewed, vetted, and approved by the U.S. Army Engineer School. The only publications that should be referenced during the execution of operations are on the following authenticated sites:

- General Dennis J. Reimer Training and Doctrine Digital Library, <*http://www.train.army.mil/*>.
- Army Publishing Directorate, <*http://www.apd.army .mil/*>.

Technical Manuals

TMs are general subject publications that contain technical information specific to the Engineer Regiment. While they are Department of the Army-approved, they are not authenticated as doctrine by the

	1st Quarter	2d Quarter	3d Quarter	4th Quarter
Fiscal Year (FY) 2012	**Conversion Complete Pending Publication** TM 3-34.22, *Military Nonstandard Fixed Bridging* TM 3-34.23, *Bailey Bridge* TM 3-34.44, *Concrete and Masonry* TM 3-34.45, *Engineer Prime Power* TM 3-34.46, *Theater of Operations Electrical Systems* TM 3-34.47, *Carpentry* TM 3-34.50, *General Drafting* TM 3-34.51, *Construction Drafting* TM 3-34.52, *Construction Print Reading* TM 3-34.53, *Topographic Surveying* TM 3-34.61, *Geology* TM 3-34.62, *Earthmoving* TM 3-34.63, *Paving and Surfacing* TM 3-34.65, *Military Soils Engineering* TM 3-34.70, *Plumbing, Pipefitting, and Sewers* TM 3-34.72, *Pile Construction* TM 3-34.73, *Port Construction and Repair* TM 3-34.82, *Explosives and Demolitions* TM 3-34.85, *Engineer Field Data* TM 3-34.86, *Rigging Techniques and Procedures*	TM 3-34.41, *Construction Planning and Estimating* TM 3-34.42, *Project Management* TM 3-34.43, *Materials Testing* TM 3-34.49, *Multiservice Procedures for Well Drilling*	TM 3-34.55, *Construction Surveying* TM 3-34.56, *Waste Management* TM 3-34.65, *Quarry Operations*	ATP 3-34.35, *Survivability*
FY 2013	ATP 3-37.10, *Base Camps* ATTP 3-90.4, *Combined Arms Mobility* (August 2011) (Renumber from ATTP to ATP) (ADPs/ADRPs and TMs Complete)	FM 3-34, *Engineer Operations* (August 2011) ATP 3-34.22, *Engineer Operations—Brigade Combat Team and Below*	ATP 3-34.20, *Explosive Hazard Operations* ATP 3-34.23, *Engineer Operations—Echelons Above Brigade* ATP 3-34.5, *Environmental Considerations* ATP 3-90.8, *Combined Arms Countermobility*	ATP 3-34.40, *General Engineering*
FY 2014	(FMs Complete) ATP 3-34.80, *Geospatial Engineering*	ATP 3-34.81, *Engineer Reconnaissance* ATP 3-90.37, *Combined Arms Improvised Explosive Device Defeat*	ATP 3-90.61, *Brigade Special Troops Battalion* (ATPs complete by December 2015)	NA

Administrative Assistant to the Secretary of the Army. There are 32 engineer FMs awaiting conversion to TMs.

Engineer Regimental Doctrine

The Engineer Regimental doctrine library will consist of 14 doctrinal manuals—1 FM and 13 ATPs. This is an opportunity to capture the Engineer Regiment's lessons learned over the past decade. Now is the time to get doctrine right. The U.S. Army Engineer School is committed to harnessing the operational experiences of the Soldiers passing through our schools. They will collect the DOTMLPF aspects and historical data as part of the Army-wide effort. This will be an exciting time for the Engineer Regiment. The commandant of the U.S. Army Engineer School and the Chief of Engineers will use our current experienced force to help update engineer doctrine and set in place procedures to keep it updated. Recently discussed was how the generating and operating forces could partner to update doctrine undergoing revision so that engineers can remain trained and prepared without losing fundamental principles, tactics, and procedures. One way to accomplish this would be to have engineer units sponsor publications that align with their mission-essential task lists. Another way would be to take advantage of engineers returning as students from recent deployments to participate in doctrinal working groups or doctrinal reviews. This will be one of the top Engineer Regimental priorities.

The Engineer Doctrine Update (page 34), which details the publication status of all the engineer manuals, has been modified to reflect Doctrine 2015.

Endnotes:

[1]ADP 3-0, *Unified Land Operations*, 10 October 2011.

[2]FM 1-0, *Human Resources Support*, 6 April 2010.

[3]FM 3-0, *Operations*, 14 June 2001.

[4]FM 3-34, *Engineer Operations*, 4 August 2011.

Lieutenant Colonel Morrow is chief of Engineer Doctrine at the U.S. Army Maneuver Support Center of Excellence, Fort Leonard Wood, Missouri. She holds a bachelor's degree in civil engineering from California State University at Long Beach and a master's degree in engineering management from Missouri University of Science and Technology at Rolla. She is a graduate of the U.S. Army Command and General Staff College, the U.S. Army Combined Arms and Services Staff School, and the Engineer Captains Career Course.

697th Engineer Company (Pipeline) Reunion

The 697th Engineer Company (Pipeline) will hold its 17th reunion in Colorado Springs, Colorado, 20–24 June 2012. For more information, call Mr. Tom Petty at (515) 981-3066 or e-mail him at <*tom697th@gmail.com*>.

Engineer Doctrine Update

U.S. Army Maneuver Support Center of Excellence
Capabilities Development and Integration Directorate
Concepts, Organizations, and Doctrine Development Division
Doctrine Branch, Engineer Division

Publication Number	Title	Date	Description (and Current Status)
Publications Revisions			
FM 3-34	*Engineer Operations*	Aug 11	This is the engineer capstone manual and contains the "box top" as our doctrinal framework; integrates the three engineer disciplines of combat, general, and geospatial engineering; and introduces the four lines of engineer support for decisive actions. **Status:** Will undergo additional revision to complement Army doctrine publications (ADPs) and Army doctrine reference publications (ADRPs) 2d quarter, fiscal year (FY) 13.
ATP 3-34.22	*Engineer Operations–Brigade Combat Team and Below*	Feb 09	This revision is pending Headquarters, Department of the Army, approval of the brigade engineer battalion. **Status:** To be published 2d quarter, FY 13.
ATP 3-34.23 (*ATTP 3-34.23)	*Engineer Operations–Echelons Above Brigade Combat Team*	Jul 10	This manual will undergo review and update as required. **Status**: To be published 3d quarter, FY 13.
ATP 3-90.61 (*FM 3-90.61)	*Brigade Special Troops Battalion*	Dec 06	This manual will undergo review and update as required. **Status:** To be published 3d quarter, FY 13.
Combat Engineering			
ATP 3-34.20 (*FM 3-34.210)	*Explosive Hazard Operations*	Mar 07	This will be a multi-Service, full revision of Field Manual (FM) 3-34.210, *Explosive Hazards Operations*. **Status:** To be published 3d quarter, FY 13.
ATP 3-34.35 (FM 5-103)	*Survivability*	Jun 85	This will be a full revision of FM 5-103, *Survivability*. **Status:** To be published 4th quarter, FY 12.
ATP 3-90.8 (*FM 3-90) (*FM 5-102) (*FM 90-7)	*Combined Arms Countermobility*	Mar 85	This will be a full revision that includes the consolidation of FM 3-90, *Tactics;* FM 5-102, *Countermobility*; and FM 90-7, *Combined Arms Obstacle Integration*. This will be a multi-Service manual that discusses countermobility and combined arms obstacle integration and their relationship to the combined arms defense and warfighting functions with regard to wide area security. **Status:** To be published 3d quarter, FY 13.
ATP 3-90.37 (*FM 3-90.119) (*FMI 3-34.119)	*Combined Arms Improvised Explosive Device Defeat Operations*	Sep 07	This will be a multi-Service, full revision of FM 3-90.119, *Combined Arms Improvised Explosive Device Defeat Operations*, and Field Manual Interim 3-34.119, *Improvised Explosive Device Defeat*. **Status:** To be published 2d quarter, FY 14.

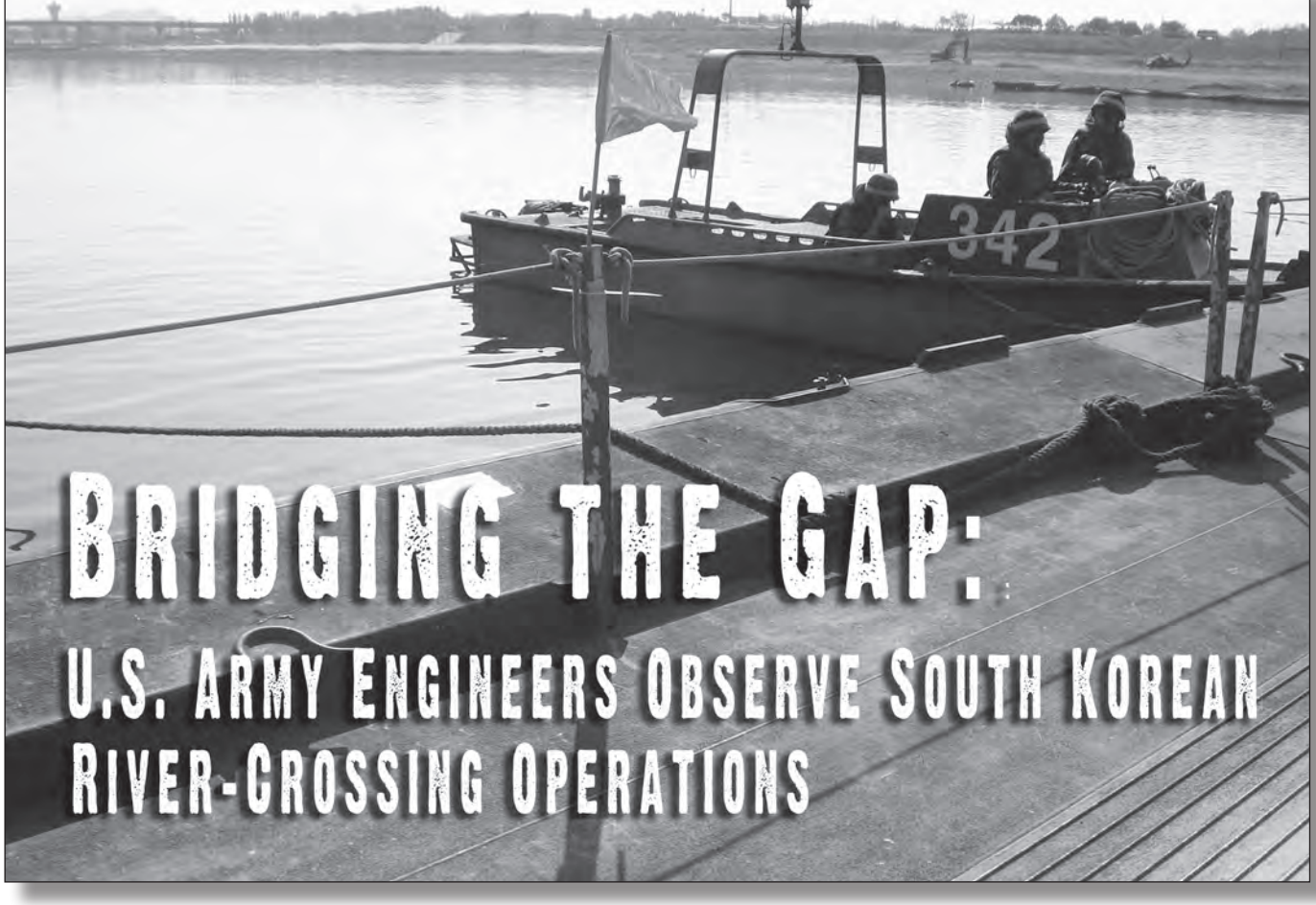
Engineer Doctrine Update

U.S. Army Maneuver Support Center of Excellence
Capabilities Development and Integration Directorate
Concepts, Organizations, and Doctrine Development Division
Doctrine Branch, Engineer Division

Publication Number	Title	Date	Description (and Current Status)
Combat Engineering (continued)			
ATP 3-90.4 (*ATTP 3-90.4) (*FM 3-34.2) (*FM 3-90.12)	*Combined Arms Mobility Operations*	Aug 11	This was a full revision, to include the renaming and renumbering of FM 3-34.2, *Combined Arms Breaching Operations*, and FM 3-90.12, *Combined Arms Gap Crossing*. Changes in the force structure have required adjustment of the tactics, techniques, and procedures (TTP) associated with breaching and clearance operations. It redefines mobility operations and includes six primary mobility tasks. **Status:** Anticipate a change document to convert manual from Army Tactics, Techniques, and Procedures (ATTP) 3-90.4 to ATP 3-90.4 1st quarter, FY 13.
General Engineering			
ATP 3-34.40 (*FM 3-34.400)	*General Engineering*	Dec 08	This manual will undergo review and update as required. **Status:** To be published 4th quarter, FY 13.
ATP 3-34.5 (*FM 3-100.4)	*Environmental Considerations*	Feb 10	This manual will undergo review and update as required. **Status:** To be published 3d quarter, FY 13.
ATP 3-34.81 (*FM 3-34.170)	*Engineer Reconnaissance*	Mar 08	This manual will undergo review and update as required. **Status:** To be published 2d quarter, FY 14.
ATP 3-37.10	*Base Camps*	New	This will be a multi-Service manual. It will be targeted for all branches (not an engineer manual solely for the use of engineers). It is a compilation of TTP found in doctrine, lessons learned, and reference material that provides an integrated systematic approach to base camps. **Status:** To be published 1st quarter, FY13.
Geospatial Engineering			
ATP 3-34.80 (*FM 3-34.230)	*Geospatial Engineering*	Mar 08	This manual will undergo review and update as required. **Status:** To be published 1st quarter, FY 14.

Note: **Current engineer publications can be downloaded from the Army Publishing Directorate Web site at <*http://www.apd.army.mil*>. Drafts may be obtained during the staffing process by contacting the Engineer Doctrine Branch at commercial (573) 563-0003, DSN 676-0003, or <*leon.cdidcodddengdoc@conus.army.mil*>. The development status of these manuals was current as of 20 January 2012.**

***Publication number of the current publication, which will be superseded by the new number at the top. Multiple publication numbers in parentheses indicate consolidation into one manual.**



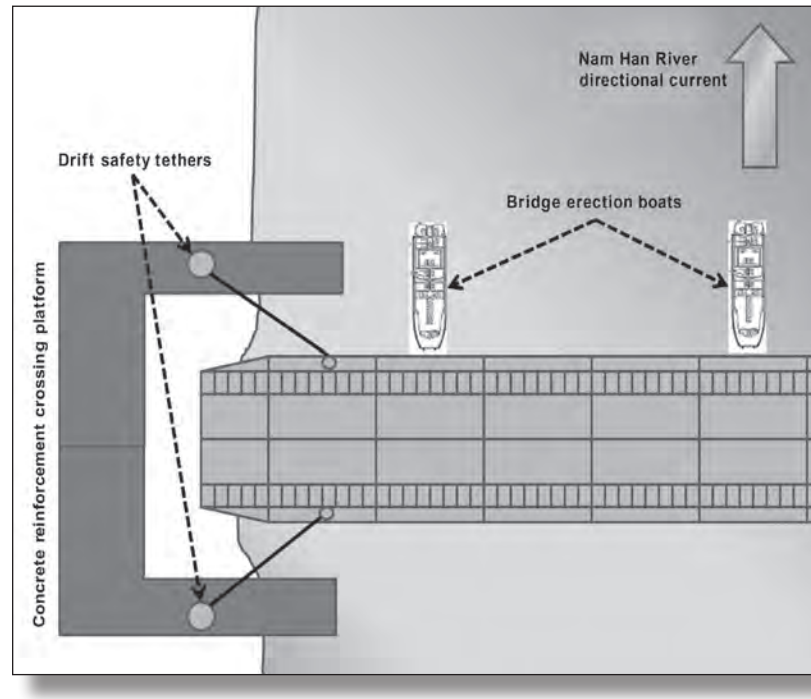
Bridging the Gap:

U.S. Army Engineers Observe South Korean River-Crossing Operations

By Major David W. Noble

As Republic of Korea (ROK) Army helicopters hovered overhead and smoke vehicles concealed the farside of the Nam Han River, U.S. Forces Korea engineer and infantry Soldiers observed the 7th Corps of the Third ROK Army river-crossing exercise in Yeoju, South Korea, in November 2011. The U.S. contingent, joined by the Combined Forces Command engineer, traveled from all over the Korean Peninsula to witness the event. Exercise Guardian Nation combined an annual division level training exercise with elements from the 7th Corps of the Third ROK Army, including—

- Armor.
- Aviation.
- Chemical, biological, radiological, and nuclear.
- Engineer.
- Field artillery.
- Infantry.
- Signal.



Preconstructed concrete platforms aid ROK training while also protecting the riverbanks.

Bridging Rivers in Korea

The terrain in Korea offers many challenges to military units attempting to maneuver there. The most significant obstacle to maneuver may be the many rivers that cross the Korean landscape. In Korea, a unit's ability to rapidly cross a river while under enemy observation and fires is crucial to success. The requirement

Bridge erection boats maneuver pontoons while smoke obscures the farside from enemy observation.

to synchronize the efforts of reconnaissance assets and maneuver, artillery, signal, and engineer units is daunting. Any opportunity to train on river-crossing operations is vital to success.

ROK Army engineer leaders linked up with U.S. leaders to fly to the ROK Army 7th Corps training exercise command center. The U.S. contingent included members from the Joint Security Area; engineers from U.S. Forces Korea; and representatives from the U.S. Army Corps of Engineers, Far East District. For that day's mission, engineer units were ordered to emplace a 275-meter float bridge across the Nam Han River at Yeoju. Infantry and chemical, biological, radiological, and nuclear elements were to be ferried across the river first to provide farside security and obscuration. Once in place, the engineer mission was to erect a float bridge so that infantry and armor elements could continue the offensive. Throughout the operation, Cobra helicopters would provide close air support. The operation was to be complete within a few hours. The U.S. and ROK observation element quickly moved from the briefing sessions to the training site.

Activating the Plan

When the observation team arrived, the mission was already in motion. Cobra helicopters were providing nearside security while smoke units obscured the engineer approach. Ferrying operations had already transported several infantry elements across the river to establish security. Engineers shifted into building the float bridge, while armor units held position in a nearby staging area. Within an hour, units were crossing the completed bridge and moving forward against enemy forces.

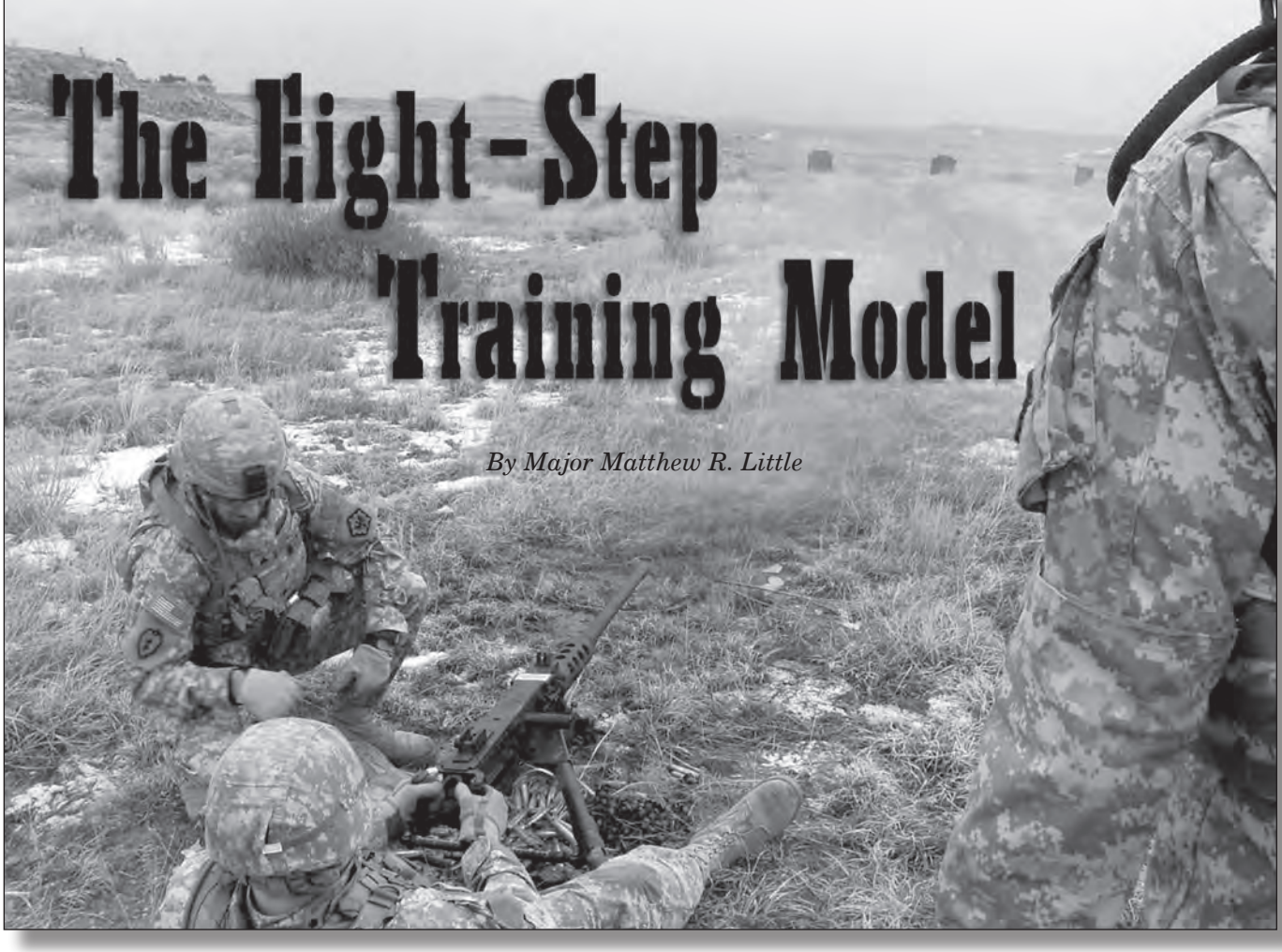
Supporting the Training Effort

The Korean government installed a series of concrete-reinforced crossing platforms along the Nam Han River as a permanent training fixture to assist the ROK Army in conducting river-crossing operations. The series of platforms, spread along several kilometers of the river, provided engineer and maneuver units with a variety of crossing locations to train. The platforms were designed to reinforce the riverbanks at the points where heavy vehicles drove onto float bridges to cross the water obstacle. The concrete platforms were only designed for entry locations on the nearside of the river, while compacted trails were constructed at farside exit points. As a safety measure, metal tethers and heavy ropes were attached to the interior bays to reinforce the stability of the bridge against the river current.

Strengthening Ties

When the mission was complete, ROK engineers had emplaced 41 interior bays across the Nam Han River. All ROK units worked cohesively to ensure that the mission was a success. The opportunity for U.S. leaders to observe ROK training proved beneficial for many reasons. The demonstration of U.S. interest in ROK training—especially engineer-related tasks—strengthened the importance of river-crossing operations. Observing their ROK counterparts in a field environment strengthened the U.S. leader confidence in their allies' abilities to perform under pressure. Finally, the collaboration between U.S. and ROK Army engineers strengthened the tactical and operational communication between the two militaries.

Major Noble is the plans and operations chief for the U.S. Forces Korea engineers. He previously served in South Korea with the 2d Engineer Battalion at Camp Castle. He holds a communications degree from the University of Tampa and a master's degree in business administration from the University of Phoenix.



The Eight-Step Training Model

By Major Matthew R. Little

The battalion executive officer gave "Captain Smith" a selection of field manuals (FMs) and described in detail the importance of a mission-essential task list (METL). Captain Smith had served as a platoon leader in Iraq and was a very competent leader. After digesting the reading material for a week, he said, "I think I understand this whole METL thing. I wish I'd had this as a platoon leader to help us get ready for our year in Iraq."

The U.S. Army has adapted extremely well to repeated deployments in the last 10 years. All things come with tradeoffs though, and one relative weakness that has resulted from a decade of frequent deployments is the lessened ability of the Army's junior leaders to prepare for and conduct training. The Army needs to look at ways to train leaders to conduct training, and the eight-step training model is a proven and effective method to accomplish this.

The Army's primary role is to fight and win the Nation's wars. During peacetime, the Army's role is to train for this wartime mission. As the Army draws down in Iraq and Afghanistan, training will be increasingly important. However, there will also be fewer resources available to conduct training, which means that leaders need to be more effective—especially at the small-unit level. A simple improvement would be to emphasize the Army's eight-step training model. Developed by U.S. Army Europe in the mid-1990s, this technique is a proven method of preparation for units and leaders.[1, 2] Unfortunately, many junior leaders are unfamiliar with it. It is not a formal part of the Army's doctrine, but it is worth reviewing, using FM 7-0, *Training Units and Developing Leaders for Full Spectrum Operations*, as a doctrinal anchor.

Step 1—Plan the training.

Planning the training starts with the unit METL. Leaders assess the unit performance to evaluate its proficiency. Units focus their training by developing a METL and establish long-range training plans that describe events and resources required to increase METL proficiency. Units plan backwards to prepare for deployments or other significant training events. These plans reflect the commander's intent and end state, with more refined training agendas developed in cyclic or quarterly training briefings. The most important thing a small-unit leader can do in this step is to identify critical items that must be trained and to explicitly accept risk in other areas where training does not occur. This helps leaders focus their time and effort on training the important tasks identified by the commander.

Too often, leaders complete their plan but neglect the preparation required to execute quality training. Completing the plan is necessary for good training, but is not sufficient by itself. Planning and preparation are two of the training management phases outlined in FM 7-0. The most difficult work is preparation, where the detailed integration is completed. If you've ever attended a substandard training event, chances are that the leadership had a plan but didn't prepare for it. FM 7-0 describes preparation in several parts (such as training the trainers and rehearsals) that overlap with the eight-step training model. Several parts of the troop-leading procedures (TLPs) described in FM 5-0, *The Operations Process* (such as conducting reconnaissance, issuing the order, and supervising and refining) also overlap with the eight-step training model (see figure). The preparation steps are essential skills that small-unit leaders must know and demonstrate.

Step 2—Train and certify leaders.

Training the trainer is a critical step during the preparation phase. This allows commanders to ensure that their subordinate leaders are knowledgeable and qualified to evaluate the training. It also allows leaders to extend their influence by empowering subordinates to achieve clear standards. Failure to complete this step results in Soldiers who are not confident in their leadership and leaders who are not clear on the training standards.

Step 3—Conduct a reconnaissance.

Found in the eight-step training model and in TLPs, conducting a reconnaissance is an important task whether conducting training or executing a mission. Leaders not only review the location where the training will be conducted, but check to ensure that resources are coordinated and prepared for execution.

Step 4—Issue an order for the training.

Leaders issue orders to establish clear tasks, conditions, and standards. This includes a concept of operations that describes how training objectives will be met, a concept of sustainment that lists the resources required and the individuals tasked to lead different parts of the training, and a timeline. Although verbal orders can be issued, written orders are more effective. Written orders become a reference for all and can be quickly disseminated and reviewed. Verbal orders require leaders to constantly repeat information, which becomes less clear with dissemination. Writing down the details of a plan avoids this problem.

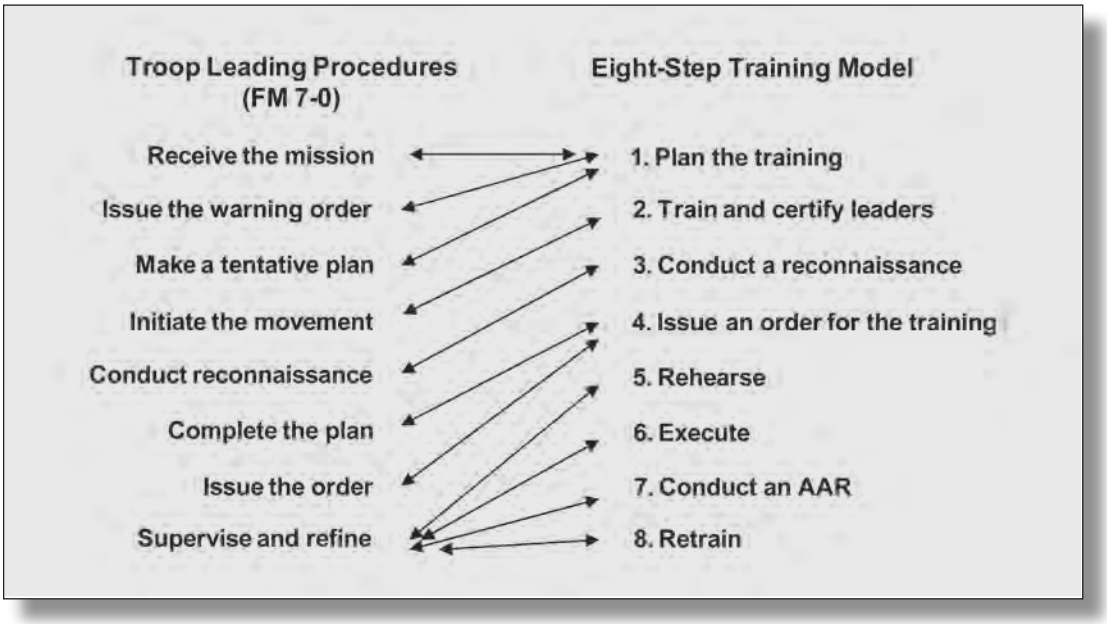
Step 5—Rehearse.

Rehearsals are critical steps in the eight-step training model and in TLPs. The four types of rehearsals described in Appendix I of FM 5-0 are—

- Backbrief.
- Battle drill/standing operating procedure rehearsal.
- Combined arms rehearsal.
- Support rehearsal.

Rehearsal techniques are limited only by leader creativity and available resources, but FM 7-0 describes six common methods:

- Network.
- Map.
- Sketch map.
- Terrain model.
- Reduced force.
- Full-dress.



Overlap between TLPs and the eight-step training model

During a 48-hour squad stakes exercise, Soldiers detain a suspect while an evaluator looks on.

Leaders select the type and technique of rehearsals and are most effective when they combine and integrate them into their timeline.

Step 6—Execute.

Leaders and units learn best by doing, not by being lectured. Classroom environments or online training can be effective in limited circumstances, but they are not appropriate for most Soldier training. Commanders should allow their units the freedom to make mistakes and learn through experience, rather than through a lecture. As units improve, leaders can increase training complexity by having Soldiers perform tasks under new conditions. The same task can be done at night; in a nuclear, biological, or chemical environment; with a different leader in charge; or with any combination of these variables. These differences will reflect the changes that units may face downrange.

Step 7—Conduct an after action review (AAR).

With contractors and other outside trainers conducting more Army training in the last 10 years, junior leaders have less experience conducting AARs. I was surprised to be approached by a company commander who asked for help conducting the AAR that would follow an upcoming training event. This reinforced the importance of the eight-step training model. One of the best references available for AARs is *A Leader's Guide to After Action Reviews*. It is available on the Army Training Network at <*https://atn.army.mil*>.

AARs can be formal or informal. Formal AARs are typically held at the company level and above, although they might also be conducted for small-unit gunnery or platoon situational training exercises. Informal AARs are usually conducted at the platoon level and below. Informal AARs can be done at any time during any training and have the advantage of giving Soldiers and units immediate feedback. Soldiers and units can learn from their efforts and quickly adapt to future operations.

There's an art and a science to conducting an AAR. *A Leader's Guide to After Action Reviews* describes the mechanics, but does not describe the interpersonal skills necessary to make an AAR truly effective. I've seen many AARs where the audience is silent, reluctant to talk, or quick to shut down discussion. Like any task, conducting AARs is a skill that can be improved with practice. Preparing for this as a part of the eight-step training model will lead to improvement.

Step 8—Retrain.

The eight-step training model is often reduced to just seven steps, with retraining completely ignored. This is a significant error, since retraining allows units to demonstrate competency and confidence in themselves and their leaders. Dedicating time to retraining allows even the best units to sustain their strengths, improve their performance, or expand their skills through adding a layer of complexity by performing the training at night, with a junior leader in charge, or some other variation to challenge the unit.

A large-scale terrain model helps the 52d Engineer Battalion prepare to construct a C-130 airfield at Camp Guernsey, Wyoming.

The eight-step training model has significant overlap with TLPs, making it especially effective for leaders at the company level and below. Leaders can implement the eight-step training model to develop effective training and simultaneously implement TLPs.

Although the eight-step training model is numbered, leaders must realize that it is not meant to describe events in sequence. As with TLPs and the military decisionmaking process, the eight-step training model is not linear. Leaders most effectively implement these approaches incrementally, by thinking through all the steps and identifying where and how information is related. Leaders frequently revisit these steps to ensure integration. For example, leaders need to identify the type and technique they will use for their rehearsal. This specific guidance needs to be published in the written order, and leaders must be trained and certified to ensure that they are adequately prepared for a specific task. A leader who follows the eight-step training model in a lockstep manner will miss this integration.

As the Army transitions from frequent deployments and adjusts to a more limited budget, effective training will become increasingly important. Preparing junior leaders to train is essential, and the eight-step training model is a simple and proven technique that can be applied to a wide spectrum of training. Engineers have applied it successfully to construction operations, and units have used it to train coalition partners in Iraq.[3, 4] It's time for a new training circular that describes a way to prepare for training events. It might be called *A Leader's Guide to the Eight-Step Training Model* and would make explicit what Army leaders have been doing for years.

Endnotes:

[1]Walter L. Sharp, *The Eight-Step Training Model (Part One of Two),* TALON: Operation Joint Forge Task Force Eagle, 3 February 2001, p. 4, *<http://www.tfeagle.army.mil/tfetalon/talon_archive/2001/talon%202001-02-03.pdf>,* accessed on 4 January 2012.

[2]Walter L. Sharp, *The Eight-Step Training Model (Part Two of Two)*, TALON: Operation Joint Forge Task Force Eagle, 17 February 2001, p. 4, *<http://www.tfeagle.army.mil/tfetalon/talon_archive/2001/talon%202001-02-17.pdf>*, accessed on 12 December 2011.

[3]Matthew Luzzatto, "Cobra Gold '99," *Engineer*, April 2000, *<http://findarticles.com/p/articles/mi_m0FDF/is_2_30/ai_64732416/>*, accessed on 4 January 2012.

[4]Julian T. Urquidez and Paul L. Yingling, "2-18 FA: Training the Iraqi Civil Defense Corps," *Field Artillery Journal*, January–February 2004, pp. 34–37.

References:

A Leader's Guide to After Action Reviews, September 2011 *<https://atn.army.mil>*, accessed on 5 January 2012. (This replaces Training Circular 25-20, *A Leader's Guide to After Action Reviews*, 30 September 1993.)

FM 5-0, *The Operations Process*, 26 March 2010.

FM 7-0, *Training Units and Developing Leaders for Full Spectrum Operations*, 23 February 2011.

Training Circular 25-30, *A Leader's Guide to Company Training Meetings*, 29 April 1994.

Major Little is the officer in charge of the 573d Construction Management Team at Joint Base Lewis-McChord, Washington. He graduated from the U.S. Military Academy at West Point, New York, and holds degrees from the University of Colorado and the U.S. Army School of Advanced Military Studies.

Should the General Engineer Battalion Transform, Again?

By Captain Walter K. Bogardus

The recent transformation of engineer construction battalions has generated much discussion. The traditional combat heavy engineer battalion, consisting of three engineer companies with vertical and horizontal platoons in each company and a consolidated equipment support section in the headquarters support company, has been replaced by an engineer battalion that consists of two vertical companies and one horizontal company. The platoons were given individual unit identification codes in an effort to make them more deployable and to allow the formation of a unit that supports the needs of the commanders on the ground, similar to the way brigade combat teams are assembled.

Lessons learned over the past year as the construction officer for the 368th Engineer Battalion, deployed to Kandahar Province in support of Regional Command–South, have highlighted an additional transformation that warrants further investigation. Forming engineer companies with broader capabilities, as opposed to the specific vertical and horizontal skills of current units, could increase engineer effects on the battlefield.

Engineer officers attend the Engineer Officer Basic Course, which is a general course that teaches the fundamentals of the entire engineer branch. Graduates may be assigned to a variety of units—route clearance company, combat engineer company, or vertical engineer company. The knowledge obtained at the course does not make graduates proficient in any of these duty positions—the real training takes place with the skills obtained and refined on the job.

This framework could also be implemented for the enlisted Soldiers in the typical military occupational specialties (MOSs) that make up the vertical and horizontal companies. As a former heavy equipment operator, I can attest to the skills obtained during advanced individual training. They touched on the basics of each piece of equipment, but proficiency required "stick time." That stick time doesn't occur in the classroom environment—it only happens after the Soldier gets to his first unit. The same can be said for all general engineering MOSs.

If the U.S. Army Engineer School restructured and created a general engineer MOS that taught Soldiers the basics of vertical and horizontal construction, company commanders would have a much more versatile force. The advanced individual training curriculum for general engineers would provide a broad understanding of the fundamentals of vertical engineering and the use of horizontal engineer equipment. Soldiers wouldn't graduate as proficient operators or master electricians, but they would possess the foundation for further training. The MOS structure would be more standardized, training would be much broader, and Soldiers would have a more diverse understanding of typical engineer tasks in a general engineer battalion than in the current specialized units. As a result, the "vertical" and "horizontal" unit designators would be eliminated and replaced with the designation of "general engineer."

Most construction missions conducted by Army engineers have vertical and horizontal components. As a result, battalions must task-organize vertical and horizontal assets to support these missions. In the general engineer company format, each company commander would have three platoons that are capable of taking on any mission with organic assets. The format would also increase the efficiency and effectiveness of the platoons. A platoon leader could use the same Soldiers for various phases of the project without having to provide one group of Soldiers to complete the earthworks and another group to construct the final structure.

On occasion, there is still the need to mass vertical or horizontal assets to complete a task. The change to a general engineer company format would not adversely affect this and could ultimately provide commanders with even more capabilities to accomplish the mission. If a project with a

No. 1 priority required a focused effort by the vertical trades, a company commander could dedicate the needed resources without any external reorganization. However, the next No. 1 priority would likely require the massing of horizontal assets. A more balanced concentration of vertical and horizontal assets at the platoon level would increase the flexibility of units to deliver the results being requested.

The terms *initial occupancy condition* and *minimum military requirements* are often used to measure the general engineering effects Army engineers provide in a tactical environment. In building tactical infrastructure, combat outposts, and forward operating bases, maneuver commanders are concerned with how quickly the task is completed. Construction engineers are often embedded with maneuver elements and tasked with building tactical infrastructure that will be immediately occupied so that operations can begin from that location. These facilities don't require tile flooring and complex wiring; they mainly consist of berms or perimeter walls, tent decks, a few guard towers, and perhaps some gravel to keep the dust down. The minimum skills required to complete this type of project could easily be encompassed in one general engineer MOS. There would still be a need for subject matter experts in vertical and horizontal construction at the unit level. We can't dispense with that strong noncommissioned officer who knows vertical or horizontal construction and can lead Soldiers. As with commissioned officers, areas of concentration could be established to give Soldiers a career track to follow and gain additional training and skills in a particular area.

Army engineers fit the definition of the "jack of all trades and master of none." They are asked to accomplish a wide variety of missions and expected to have a general understanding of all aspects of military construction. Developing junior Soldiers as general engineers could potentially increase the combat effectiveness of Army engineers and make the general engineer battalion even more diverse and capable of taking on whatever challenges arise.

When he wrote this article, Captain Bogardus was the officer in charge of the construction management section of the 368th Engineer Battalion at Kandahar Airfield, Afghanistan. He holds a bachelor's degree in civil and environmental engineering from The Citadel, Charleston, South Carolina, and is pursuing a master's degree in civil engineering from the University of Connecticut. He is a professional engineer in Connecticut.

ARMY CAREER TRACKER WEB SITE OPENS TO ENGINEER OFFICERS

By Lieutenant Colonel Brian Slack

On 23 January 2012, the Army Career Tracker (ACT) Web site officially opened to all engineer officers. Officers can log on at <*https://actnow.army.mil/*> for a "one stop shop" of engineer-related news, information, and career planning resources.

The ACT program, first unveiled to the enlisted force last summer, now also provides officers with a personalized look at their training, education, and assignment history alongside items that their branch designates as important. Officers can then use this information to develop their personalized career plan. ACT will offer leaders, raters, and mentors new ways of communicating with their Soldiers and monitoring their careers. When officers log on, they will select their rater and choose any number of mentors. Then, raters and mentors will be able to view an officer's education, training, assignment history, and future desires during mentoring and counseling sessions. ACT is designed to be accessed with a Soldier's Army Knowledge Online credentials and to seamlessly draw information from eight channels that support personnel, training, and military/civilian education programs.

On the *Career Resources* tab, ACT defaults to the Engineer Branch homepage where relevant and useful news and information are posted. On the *Officer* tab, it is possible to review past assignments, training, and self-development activities alongside Engineer Regiment recommendations for the officer's current pay grade and the next two higher pay grades. The recommendations follow Chapter 14 of Department of the Army Pamphlet 600-3, *Commissioned Officer Professional Development and Career Management*.[1] A useful feature of the Web site is a printable career map. Most entries are hyperlinked to additional information to help officers make better-informed decisions. All engineer officers are encouraged to explore this new Web site and provide feedback to the Engineer Personnel Development Office at <*leon.usaeshqrfi@conus.army.mil*>.

Endnote:

[1]Department of the Army Pamphlet 600-3, *Commissioned Officer Professional Development and Career Management*, 1 February 2010.

Lieutenant Colonel Slack is chief of the U.S. Army Engineer School Engineer Personnel Development Office.

Critical Integration:

The Brigade Combat Team Engineer Coordinator and Geospatial Engineering

By Captain Colleen Reiss Vermeulen

In recent years, the civilian and military use of geospatial information has become more advanced and significantly more widespread. In the Army force structure, organic geospatial engineering assets have been positioned at the brigade level. But what are engineer staff officers doing differently to fulfill their role in this changed environment?

If we step back from our on-the-ground experiences and examine how this essential engineering function is coordinated at the tactical level, the technological and organizational transformations have not been accompanied by an evolving vision of how engineer staffs integrate geospatial support to help accomplish a brigade combat team (BCT) commander's mission. The ability to leverage geospatial information and services lags far behind the technology. Instead of expanding the accessibility, efficiency, and effectiveness of geospatial support across a BCT staff and subordinate units, Army engineers often use it to accomplish the same tasks in the same way, but with a higher "wow" factor.

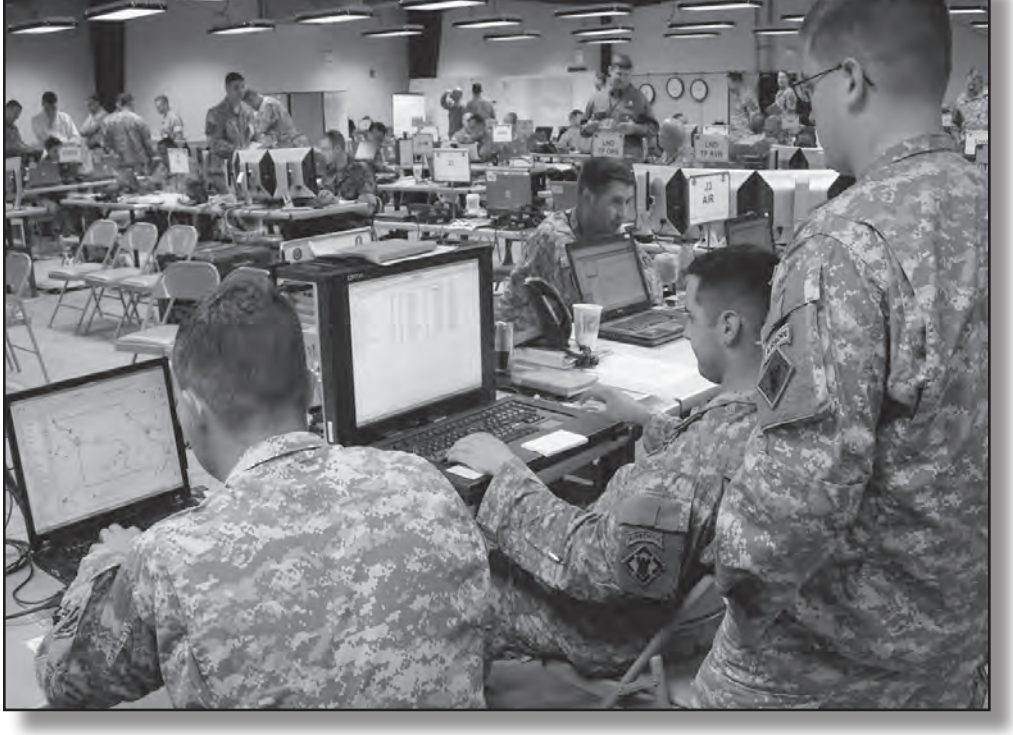
Importance of the BCT Engineer

The BCT engineer coordinator occupies a critical distribution and integration point for geospatial engineering. Since the BCT is the lowest echelon in the Army with organic geospatial assets, the BCT geospatial section operations and the integration capabilities of the engineer coordinator determine if subordinate forces—from battalion staff to patrol leaders—receive timely and relevant geospatial support. Field Manual 3-34.22, *Engineer Operations—Brigade Combat Team and Below*, places this responsibility on the engineer coordinator, who "must understand the full array of engineer capabilities (combat, general, and geospatial engineering) available to the force and synchronize them to best meet the needs of the maneuver commander."[1]

The Challenge

Staff engineers are responsible for coordinating geospatial support across the BCT, but this function is often neglected. The first reason is fairly obvious—a BCT engineer coordinator is busy. Engineers on a BCT staff must plan and execute a wide range of missions using organic and external engineer assets. The pressing necessity of organizing a route clearance mission to support a maneuver operation, synchronizing external bridging assets, or coordinating the construction of a combat outpost are "unavoidable" engineer tasks. If the BCT engineer staff fails to plan or execute these engineer functions, the commander certainly notices and squarely assigns blame to the engineer staffs and units. The geospatial function differs in a way that often allows engineers to gloss over it or function on "autopilot" with little perceived negative impact. For example, unlike combat or general engineering forces, geospatial analysts in a BCT are not under the direct control of an engineer commander. Instead, geospatial analysts are part of the BCT staff, often task-organized within an intelligence, geospatial intelligence, or protection section. This means that, although the BCT engineers may not have direct control of geospatial assets, the responsibility for integrating geospatial engineering throughout the entire operations process still remains. It is a responsibility centered on function, rather than command and control of assets—a different, but no less important, type of responsibility.

The second reason that BCT engineer staffs do not attempt to seize the mantle of responsibility for integrating geospatial support across the staff and subordinate units lies in self-imposed perceptions of expertise. Engineer officers have come to believe that geospatial support is so technical that only specialists—those with an academic background in geospatial information—can provide good leadership in



Geospatial analysts can offer predictive analysis and problem solving when they are integrated into the routine information synthesis of a battle rhythm.

a BCT. It is important to remember that just as the lack of a civil engineering degree is not an excuse for an engineer officer to ignore coordinating construction operations, the lack of academic or technical expertise in geospatial analysis does not excuse a BCT engineer coordinator from ensuring the full integration of geospatial support into BCT operations.

Small Steps, Big Impact

These challenges are real, but the responsibility to oversee all three Army engineer functions—combat, general, and geospatial—at the BCT level is also real, and vitally important for mission success in today's complex operational environment. We can start by focusing on high-impact techniques for integrating geospatial support that demand small commitments of time and do not require technical expertise. The responsibility of the engineer coordinator is not to do geospatial analysis—which is provided by talented geospatial information technician warrant officers and geospatial engineer enlisted Soldiers—but to integrate it into BCT operations. The engineer coordinator can make significant improvements in geospatial support at the BCT level by focusing on the following questions:

1. Is the entire unit, or just the staff, getting support?

Check the geospatial section tracking list of products or requests for information for the past month or quarter. If an overwhelming majority of the section outputs are for the intelligence or operations and training officer, subordinate units may not be receiving robust geospatial support. While the BCT intelligence and operations and training sections are important and need significant geospatial support, subordinate units can benefit greatly from visualizations for rehearsals, route studies, and more. If subordinate units are submitting requests to the BCT geospatial team and not receiving timely, relevant products, they may become frustrated and simply stop making requests. It is also possible that subordinate units, especially nonorganic ones, may not know the capabilities of the BCT geospatial assets or how to request support. Engineers should ensure that all BCT staff sections and subordinate units receive the support they request, understand the capabilities, and have an efficient method for requesting support.

Engineer Staff Officer Geospatial Support Checklist

- ✓ Subordinate units (not just the staff) receive timely geospatial support and know how to make requests from the BCT geospatial capabilities.
- ✓ Geospatial analysts have the situational awareness to provide proactive analysis to BCT decisionmaking and operational cycles.
- ✓ Analytical tools and capabilities are known and used.
- ✓ BCT staff and subordinate units can provide basic "self service" functions without using geospatial section assets.
- ✓ Staff and subordinate units can reprint the most popular and frequently requested map products using plotters.
- ✓ Geospatial data is routinely sent to higher headquarters.
- ✓ Standard operations include integrated geospatial support without a specific request.
- ✓ The geospatial section is certified as "trained" by an external geospatial analyst, warrant officer, or technician with advanced or equivalent skills and experience.

2. Is geospatial support reactive or proactive?

Investigate how consistently geospatial support is provided in response to a specific request in comparison to analyst-generated products. When engineer staffs fail to integrate geospatial support into BCT planning and decisionmaking cycles, geospatial support can become reactive, where a geospatial section only makes products that specific members of the staff or subordinate units request. While this is beneficial and responsive, it does not capture the full role of the trained geospatial analysts. Like intelligence analysts, geospatial Soldiers must continually assess the environment and changing situation based on a commander's intent and understanding of current operations. Engineer officers can ensure that the geospatial section has a routine method, such as battle update assessment or situation report, for building situational awareness and communicating relevant geospatial information and analysis to the staff and subordinate units.

The widespread use of plotters empowers staffs to print map products from easy-to-access, digital geospatial information.

3. Are geospatial assets being used for analysis and recommendations or merely helping staffs visualize?

Products that display operational control graphics, boundaries, political regions, routes, cities, and unit locations are needed and loved by all, but these visualization products are only one part of how geospatial support can be integrated into BCT operations. Analysts can fuse multiple sources of data into geographic patterns to provide predictive analysis and incorporate the effects of the operational environment to solve problems. In addition to requesting specific products, staffs and subordinate units can be coached by engineer officers to bring questions like the following to the geospatial section:

- Based on your data, where is the best location for a patrol base?
- Where are the most likely criminal trafficking routes?

This exploits geospatial data and analysts to their fullest extent in the unit, rather than limiting it to the capabilities of those requesting products. Engineer officers are critical for facilitating this shift from viewing geospatial assets as "terrain information providers" to "analysts."

4. What self-service geospatial capabilities do staffs and subordinate units use on a regular basis?

Many years ago, hosting a network of files and posting up-to-date announcements on an Internet or intranet site was the realm of computer programmers. Today, with programs such as Microsoft Sharepoint™, almost every member of a unit staff can create a useful page for storing, editing, and exchanging digital information. The ability to use geospatial information has also evolved, and staff engineers can integrate geospatial support into operations by empowering other staff and subordinate units to perform self-service geospatial tasks independently. The engineer coordinator can play a key role in introducing programs such as GeoPDF® to the staff and leveraging the geospatial section to provide ready-to-import data in an easily accessible network location. The most challenging aspect of putting entry level geospatial applications to work is in finding the data, not in using the interface, as most staff members are comfortable exploring new software. By providing an entry level program and the relevant data to the staff and subordinate units, the BCT geospatial section can be more efficient, devoting limited resources to analysis and products that only they have the capabilities to generate.

5. Are the same completed geospatial products requested repeatedly?

If the geospatial section tracking list of completed products contains many separate requests for the same product, then the section productivity for analyzing and developing new specialized products is being greatly reduced. In an environment where many staff sections have access to plotters, staffs can print additional or updated copies of popular products without a request to the geospatial section. Engineer officers can make this possible by ensuring that a digital product repository or "library" of products for the BCT is created in a shared folder or on a network

Web site. The geospatial section can update this library with preformatted digital copies (such as portable document format [PDF] versions) of completed products, thus enabling network users to print copies of the frequently requested unit products.

6. Is the next higher geospatial section getting updates?

One of the roles of a BCT geospatial section is to provide updates to the unit portion of the theater geospatial database through higher echelon geospatial forces. When BCTs do not feed valuable geospatial data higher, the information that a section collects will not serve other units that are conducting operations in the area or units that may need the data in the future. Engineer staff officers must oversee this integrative function by finding out when the next higher headquarters geospatial section wants updates, what features it is collecting, and what file structure is used. Most importantly, the engineer staff must ensure that the geospatial section does not become entirely focused on current operations and fails to send the data up to higher headquarters.

7. Are geospatial products part of standard operations?

When geospatial support becomes integrated into the routines of a BCT, staffs and subordinate units receive support without asking. For example, patrol or convoy prebriefings should always include relevant geospatial information; a leader should not have to make a request. Mission debriefings should include questions about discrepancies between on-the-ground observations and geospatial products or maps provided. Similarly, a unit intelligence summary should regularly include geospatial intelligence. For the BCT engineer coordinator, integrating geospatial support into the battle rhythm and standard operations of the BCT pays significant dividends as the presence of geospatial information enables those outside the engineer section to integrate it into their planning and operations.

8. Are we trained? What are we doing to train?

Geospatial analysts require individual and collective training and validation exercises, just like the rest of the BCT staff. As the integrator of geospatial support, engineer officers must provide the oversight and coordination assistance necessary to help a unit geospatial section grow professionally. The role of staff engineer is not to be the subject matter expert, but to coordinate for external support to train and validate a BCT geospatial section in its collective tasks and to move the analysts toward an even higher level of professional competency. Some sources for accomplishing this include—

- The National Geospatial-Intelligence Agency National Geospatial-Intelligence College.
- The Deputy Chief of Staff, Intelligence, Army Foundry Intelligence Training Program.
- Local technical colleges.
- Geospatial warrant officers from other units or echelons.

Start Somewhere

This list is not intended to be exhaustive, but it is a realistic starting point for all staff engineers. Engineer officers have a responsibility for integrating geospatial support into their units, even if that does not entail direct control of the geospatial section. Engineer officers have that capability, since advanced technical expertise is not required to take an active role in planning and integrating geospatial support throughout BCT operations. Small steps make a large impact in this critical field, and the time for every engineer coordinator to start assessing geospatial support in his or her BCT is now.

Endnote:

[1]Field Manual 3-34.22, *Engineer Operations—Brigade Combat Team and Below*, 2 November 2009.

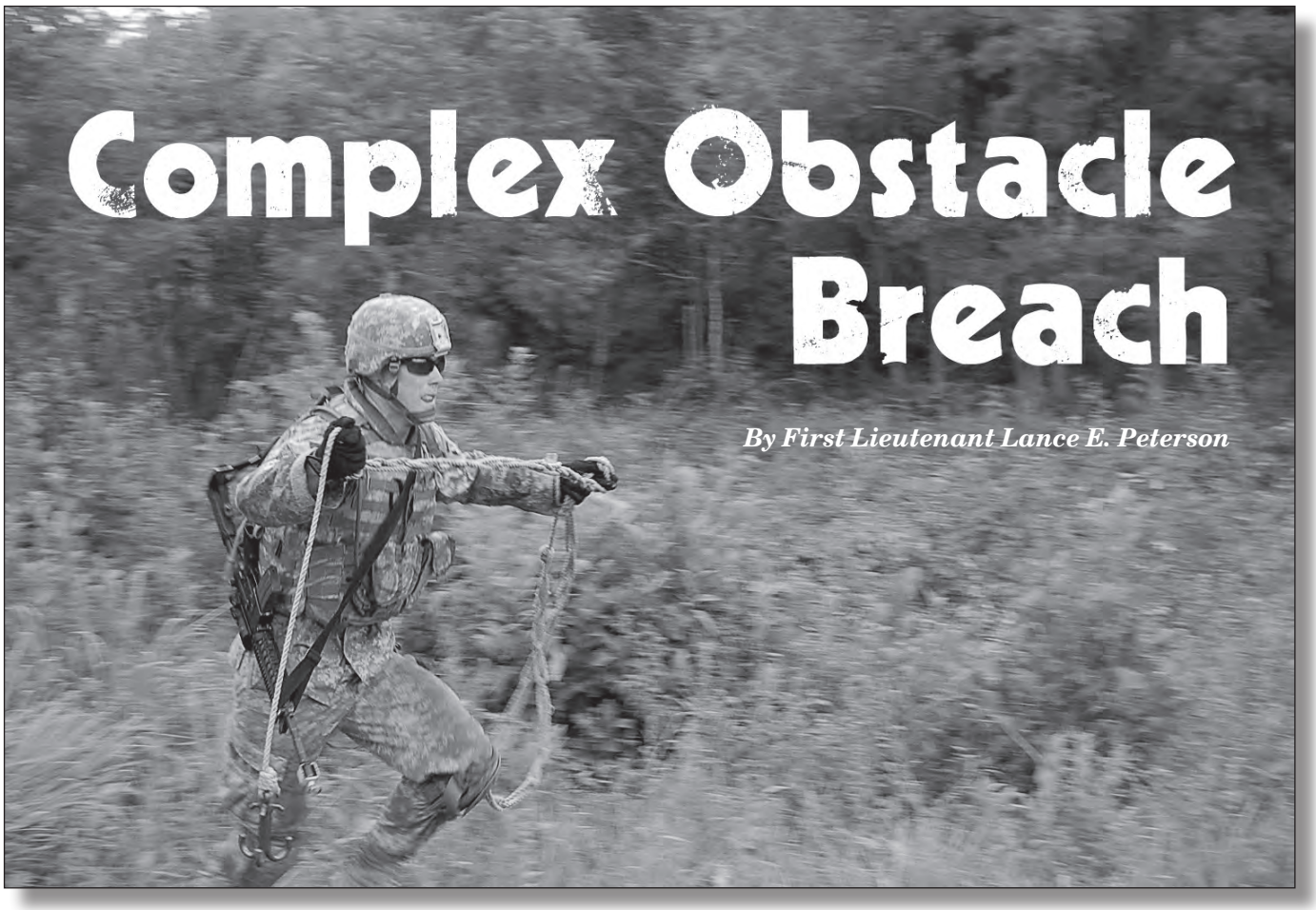
Captain Vermeulen is assigned to the 4th Battalion, 413th Regiment (Senior Reserve Officers' Training Corps), and serves as an assistant professor of military science at the University of Notre Dame, where she is also a graduate student. Former assignments include: commander of the 100th Engineer Company (Geospatial); plans officer for the 20th Engineer Brigade; and platoon, company, and staff assignments in the 30th and 37th Engineer Battalions at Fort Bragg, North Carolina. She holds a bachelor's degree in government and history from Cornell University.

(Clear the Way, continued from page 2)

great Nation. The Best Sapper Competition culminates on Saturday morning; and the Army Engineer Association will then host an Awards Luncheon, where we will recognize the winners of the Itschner, Grizzly, Van Autreve, Outstanding Warrant Officer, and Outstanding Civilian awards. Finally, we will honor our award recipients and will present the Gold deFleury to this year's winners. You can find the latest information on ENFORCE at <*https://www.wood.army.mil/enforce_2012*>.

We need to see you at ENFORCE, and we need to harness your minds and experiences as we shape our Engineer force for the future of our Nation. We have a packed agenda that will allow us to come together and celebrate the accomplishments and sacrifices of our units who are engaged in combat, and it will allow us to visualize the new operational environment as we build our Regiment to meet the challenges that come with it—just as we have done since 1775.

Essayons!



Complex Obstacle Breach

By First Lieutenant Lance E. Peterson

After 11 days in sweltering heat, the Soldiers of Alpha Company, Special Troops Battalion, 4th Infantry Brigade Combat Team, 1st Infantry Division, reached the final training event in a brigade field training exercise at Fort Riley, Kansas. They awaited their chance to showcase their talents in conducting a dismounted complex obstacle breach on a wire-mine-wire obstacle.

A platoon level complex obstacle breach requires a coordinated effort with multiple actions on the objective occurring simultaneously, which is an exceptionally difficult and important part of the combat engineer mission-essential task list in an infantry brigade combat team. Unfortunately, combat engineers of today do not always get to practice this important skill because of the myriad of other tasks they must accomplish in the short dwell time they have between deployments. The primary reason that typical engineer companies lack this type of training is that, in our current conflicts, route clearance has become the focus for combat engineers. The types of countermine operations now being performed do not require the same proficiency in complex or combined arms breaches—let alone the emplacement of antitank mines—as the Engineer Regiment had 15 years ago. However, the complex obstacle breach is still a vital task that needs to be continuously trained to combat engineers, young and old. Though not directly applicable to current operations, conditions could change at any time. It is imperative to prevent the atrophy of skills that allow Army engineers to perform their core functions of providing mobility, countermobility, and survivability support to maneuver units.

Extra dwell time allowed Alpha Company to shift its focus onto tasks that are trained far less frequently—yet are no less important—than those that have been the typical focus of engineer-specific training. The ability to integrate more recent additions to the engineer mission-essential task list with long-standing core engineer tasks will help prepare the company to perform full spectrum operations.

The Soldiers of Alpha Company entered the "train/ready" force pool of the Army force generation cycle in February 2011 with an opportunity to train on individual combat engineer tasks; it was a chance to get back to the basics of being full spectrum combat engineers. Quarter by quarter, the company increased the level of training from individual and fire team levels to squad and section levels. They finished unified land operations training at the platoon level by the fourth quarter of fiscal year 2011. During this time, sergeants and staff sergeants were arming M15 and M21 antitank mines for the first time in years and arming a modular pack mine system for perhaps the first time in their careers. Equipment operators were digging individual and crew-served weapon fighting positions for the first time in years—or in their careers—as well.

Combat engineer Soldiers assault through the obstacle enroute to destroy the enemy on the objective.

During Alpha Company's final training exercise, each platoon was required to create a lane through a wire-mine-wire obstacle using manual techniques in the time limits established in Army doctrine. Failing to complete the breach to standard labeled the platoon as deficient, earning them a spot back at the line of departure. Some of the company platoon sergeants had trained on this task before, but this was the first experience of conducting a platoon breach for many junior Soldiers. This meant that platoons had an extended execution phase spread over 3 days. The first day of the exercise was allocated for platoon leaders to receive the operations order and begin troop leading procedures and rehearsals at lower levels. The execution phase consisted of a full day of dry runs, a full day of blank runs coupled with demolition explosive simulators, and the final day when each platoon conducted a live breach.

Alpha Company took some risk in its training plan in the fourth quarter by focusing solely on mobility tasks because there was not room on the training schedule for platoon level, high-intensity, conflict-based countermobility tasks. The need to begin training on assumed deployment task requirements and equipment outweighed the need to become "trained" on all mission-essential tasks. The transition of the Engineer Regiment from a deployment-centered organization to a full spectrum operations-centered organization will not happen overnight. The transition won't be complete until a deployable engineer unit can complete the full 2-year Army force generation cycle without the disruption of a deployment. Alpha Company was fortunate to have enough time to train on full spectrum operations tasks and to exercise a different style of training management at the company level and below. The company had only small amounts of required training, which left plenty of room on the schedule for tasks that the company leadership felt needed training. For the first time in years, junior leaders had input to help shape the direction of training and the training management system.

The Army has made a lot of changes to its professional schooling to create adaptive leaders who do not just survive, but thrive in an asymmetric battlefield environment. The future will see a decrease in deployments, so we could see a decrease in the number of adaptive leaders because of the routine and structured nature of training that focuses on the mission-essential task list. The key to maintaining adaptive leaders in a peacetime Army will depend on commanders who provide multifaceted training events that present leaders with unfamiliar situations. This type of training will force them to think critically, to be creative, and to exercise moral and ethical decisionmaking skills. These skills are—and will remain—the most important traits required for junior leaders to be ready for the next conflict as the Army transitions out of its decade of war.

First Lieutenant Peterson graduated from the U.S. Military Academy in 2009. He is also a graduate of the Airborne, Air Assault, and Counter Explosive Hazard Planners Courses. He was a platoon leader during the exercise described in this article and now serves as the executive officer for brigade Headquarters and Headquarters Company, 4th Infantry Brigade Combat Team, 1st Infantry Division.

Targeting in an Engineer Brigade

By Major Gary S. Bonham and Major Jakob C. Bruhl

While deployed to Mosul, Iraq, during Operation Iraqi Freedom, the 130th Engineer Brigade struggled to use targeting methodology. To correspond with its major efforts, the brigade had developed four lines of effort (LOEs):

- Reconstruction.
- Assured mobility.
- Iraqi Security Force partnership.
- General engineering.

Then, the brigade attempted to use targeting to—

- Give the commander situational awareness on the progress of LOEs.
- Obtain the commander's guidance.
- Revise resource priorities.

However, the attempt to use the targeting process did not seem to work. Targeting meetings devolved into commander update briefings, the targeting working group became a rehearsal for the targeting meeting, working groups conducted by the LOEs had little connection to the targeting meetings, and intelligence was not clearly integrated into each LOE. Frustrated, brigade leaders reexamined and revised the targeting process. This enabled the brigade to better incorporate the LOE working groups and changed the commander update briefings into true targeting meetings.

This article examines the targeting process and how engineer brigades operating in counterinsurgency or stability operating environments can benefit from using it. It is the authors' contention that the targeting process can help engineer brigade staffs and commanders develop frameworks to guide and assess progress in achieving campaign objectives and end states. An effective targeting process enables LOEs such as assured mobility, general engineering, reconstruction, or security force assistance to conduct effective working groups that are linked to the targeting process and supported by the entire staff to achieve their goals. It gives the staff an effective way to show the commander the progress toward objectives and end states and gives the commander the necessary framework to allocate resources and establish targeting priorities.

Since "targeting is the process of selecting targets and matching the appropriate response to them, taking into account operational requirements and capabilities,"[1] it should apply across the warfighting functions and to all units. The targeting methodology used is a time-tested and proven cyclical method for identifying, tracking, and engaging targets, followed by an assessment of effectiveness. The U.S. Army applies the same targeting methodology to information operations that it does to lethal operations. Field Manual (FM) 3-24, *Counterinsurgency*, states that the methodology applies to "all operations, not just attacks against insurgents."[2] It further states that ways to engage nonlethal targets include "CMO [civil-military operations], IO [information operations], negotiation, political programs, economic programs, social program and other noncombat methods."[3] The manual stops short of explaining how to use the targeting methodology in nonlethal operations or by other-than-maneuver units.

Targeting can effectively occur only within the context of an operational or tactical framework. The framework developed by the 130th Engineer Brigade allowed the commander and staff to "continuously assess the current situation and the progress of the operation and compare it with the concept of operations, mission, and commander's intent."[4] As FM 3-24 states, "operational design and execution cannot really be separated. They are both part of the same whole."[5] Targeting is the link between the plan design and execution; the targeting process provides flexibility to adjust to changing conditions, identify new opportunities to meet the commander's intent, and synchronize efforts across the organization.[6] Prompted by several factors—including

coaching by the observers/trainers at the brigade mission readiness exercise in April 2009—the brigade staff set forth to apply the targeting process in its battle rhythm.

During the exercise and the first several months of its subsequent deployment to Iraq, the staff struggled to apply the methodology to its operations, which were organized along the four LOEs.

Only one of these LOEs had a traditional use for targeting—assured mobility identified violent extremist networks and improvised explosive device cells to target. Although the brigade did not have maneuver forces available to attack these targets, the assured mobility officer in charge participated in the U.S. Division–North and supported brigade combat team counter improvised explosive device working groups. For the other three LOEs, the use of targeting methodology was not intuitive and, in most cases, was applied very loosely.

Recognizing the need to make it work effectively, the brigade staff began to review the targeting process by developing a targeting synchronization matrix. While this would help the brigade track targets, a broader framework of objectives linked to the desired end states of each LOE was required. The brigade started with the end state and four key objectives that had been developed for each LOE. Further refining these, the brigade developed intermediate objectives for each key objective. As key objectives were revised and intermediate objectives were developed, care was taken to ensure that these were worded as objectives rather than as tasks. For each intermediate objective, LOE officers in charge attempted to identify measures of performance (MOPs) and measures of effectiveness (MOEs), along with a date that the LOE was expected to reach its objective.[7] The MOPs and MOEs included "observable, quantifiable, objective data as well as subjective indicators to assess progress measured against expectations."[8]

The intermediate objectives represented the basis of what the brigade would work toward, and the MOPs and MOEs provided agreed-upon goals. Targets were linked to one or more intermediate objectives and were tracked using the targeting synchronization matrix. Once that framework was established, the brigade could effectively use the targeting process. Using a standard "red, amber, and green" scale, the LOE officers in charge gave the commander a visual assessment of each intermediate objective during targeting decision briefings. Targets were derived from this assessment.

Targets were identified, planned, and resourced using the "decide-detect-deliver-assess" methodology described in FM 6-20-10, *Tactics, Techniques, and Procedures for the Targeting Process*.[9] The LOE assessment provided the tool to identify potential targets. For example, if an intermediate objective was assessed as "red," the LOE officer in charge would be expected at least to have considered proposing a target to address that particular objective. (This was not a rigid requirement, and a target was not required if circumstances dictated otherwise.) However, if an intermediate objective was assessed as "green," there was no expectation for a proposed target, although there could be a reason to identify one to sustain the current assessment.

In most cases, a traditional understanding of the *decide* function applied:

- Developing priorities for tasking assets.
- Gathering and processing information.
- Determining a method to attack (or in most cases for the engineer brigade, affect or influence) the target.
- Assessing the effectiveness of the attack.

The *detect* function took a bit of a cognitive stretch to apply to the engineer brigade operations. Instead of determining which intelligence assets to devote to positively identifying the target, this function was combined with the *deliver* function to describe how the desired results should be reached. In most cases, the target was already identified. Since they were not moving targets in the traditional sense, detection did not neatly apply.

"Since 'targeting is the process of selecting targets and matching the appropriate response to them, taking into account operational requirements and capabilities,' it should apply across warfighting functions and to all units."

Intelligence related to each LOE was incorporated into working groups. Some reporting was used to provide cultural background, while more reliable intelligence was integrated into target development. LOE officers in charge developed targets to mitigate a threat or capitalize on an assessed enemy vulnerability. By doing so, intelligence-driven operations became more obvious and allowed the commander to determine if the MOPs and MOEs should be adjusted to satisfy the desired end state.

The *deliver* function—"a technical solution,"[10]—applied; but instead of choosing specific attack units and the type of ordnance, it described how to execute the plan. In some cases, the delivery method resulted in a fragmentary order to subordinate units; in other cases, it led to staff action. The *assess* function was applied with very little deviation from the traditional understanding within targeting. Instead of assessing battle damage and munitions effects, targets were

assessed against the MOPs and MOEs identified during target development. In most cases, these were more subjective than quantitative.

Identifying the target, determining how to deliver required actions, and assessing their effectiveness are critical steps. In order to turn them into action, they must be approved by the commander. The brigade staff used a series of tools to inform the commander and seek decisions. Charts linked proposed targets to intermediate objectives and outlined the concept of the operation for the targets.

The final step in linking the targeting process with the campaign plan was to reassess the intermediate objectives upon the successful completion of a target or after the occurrence of outside events that could have an influence on an intermediate objective. From the updated intermediate objective assessment, the key objectives could be reassessed. Finally, a summary chart aided the brigade commander's understanding of the brigade progress toward the defined end state and provided a framework for additional guidance. This summary chart was presented every 2 weeks during the targeting decision briefing.

The 2-week targeting cycle evolved throughout the deployment. The brigade began with a 1-week cycle. After a few months of this battle rhythm, the staff agreed that it was too short for the pace of operations. Too much time was being spent preparing for meetings at which little change was presented. By changing to a 2-week targeting cycle, the brigade remained nested in its higher headquarters targeting cycle, provided adequate time for staff and subordinate units to effect change, and reduced the meeting preparation burden on the staff, which freed up more time to effect change. The brigade targeting cycle was driven by LOE working groups, which met weekly and fed into the bimonthly targeting working group that met the day before the targeting decision briefing to the commander. The targeting working group brought the staff together "to synchronize the targeting process and obtain approval for and/or changes to the targeting products."[11]

With the new battle rhythm, the staff had a more interactive and productive targeting working group that was no longer just a rehearsal for the upcoming briefing to the commander. Instead, the group had time to vet and discuss new targets, analyze and debate new assessments of intermediate and key objectives, and adjust following the working group. This translated into a more productive targeting decision briefing. Targets were now linked to intermediate objectives that were linked to the key objectives that were linked to the end state. Assessments of enemy actions and environmental factors were fully integrated into each LOE. The commander could look at the targets, compare them to his targeting priorities and the LOE assessments, and make a quick visual determination if they were in agreement. Another benefit of the new battle rhythm and revised targeting process was that they allowed the commander to review the targeting briefing before the meeting and prepare guidance and questions.

Targeting is not just for maneuver units; the process has great value for engineer brigades that are conducting counterinsurgency or stability operations. The effective use of the targeting methodology allowed the 130th Engineer Brigade to link targets to desired end states. It also allowed the brigade to conduct effective assessments of progress toward the desired end states through the intermediate and key objectives developed in support of the targeting process. The targeting process that the 130th Engineer Brigade developed during Operation Iraqi Freedom was an important contributing factor to brigade success and can serve as an example for other engineer brigades to use in the future.

Endnotes:

[1]FM 6-20-10, *Tactics, Techniques, and Procedures for the Targeting Process*, 8 May 1996, p. 1-1. (Superseded by FM 3-60, *The Targeting Process*, 26 November 2010.)

[2]FM 3-24, *Counterinsurgency*, 15 December 2006, para. 5-100.

[3]Ibid, para. 5-103.

[4]FM 3-0, *Operations*, 14 June 2001, para. 5-84.

[5]FM 3-24, para. 5-116.

[6]FM 6-20-10, p. 1-1.

[7]FM 3-0.

[8]FM 3-24, para. 5-96.

[9]FM 6-20-10.

[10]Ibid, p. 1-6.

[11]FM 3-09.12, *Tactics, Techniques, and Procedures for Field Artillery Target Acquisition*, 21 June 2002, p. 1-6.

Major Bonham is the executive officer for the 84th Engineer Battalion. He holds a bachelor's degree from the University of Nevada, Reno; a master's degree from the University of Missouri–Rolla (now Missouri University of Science and Technology); and a master's of military art and science from the Naval War College. He is a professional engineer in the state of Nevada. When this article was written, he was the plans officer for the 130th Engineer Brigade.

Major Bruhl is the officer in charge of the 14th Engineer Detachment. He holds a bachelor's degree from Rose-Hulman Institute of Technology; master's degrees from the University of Illinois at Urbana–Champaign and the University of Missouri–Rolla (now Missouri University of Science and Technology); and a master of military art and science degree from the U.S. Air Force Air University. He is a professional engineer in the state of Missouri. When this article was written, he was the design engineer for the 130th Engineer Brigade.

What Do You Mean, "SHAPE Isn't NATO Headquarters"?

By Lieutenant Colonel Chris Becking

Imagine my excitement as I considered my assignment to Supreme Headquarters Allied Powers Europe (SHAPE), in Mons, Belgium. But upon arriving, that excitement turned into a growing confusion, culminating in the question: What do you mean, "SHAPE isn't NATO headquarters"? Thus began 6 weeks of learning the basics of the North Atlantic Treaty Organization (NATO), followed by a year of discovering how much more there was to learn. While our alliance partners may easily serve multiple NATO assignments during their military careers, U.S. Army Soldiers rarely receive even one NATO assignment in a typical career. From my own experience, and the similar experience of most of my U.S. Army peers working in NATO, I believe that our U.S. Army education (formal and informal) about NATO is severely lacking. However, as the United States moves to a more austere future budget (just as our alliance partners are doing), we are likely to conduct more operations with NATO. Thus, to be effective contributors in these future operations, we need to obtain a better working knowledge of NATO structures and operations, dispel some misconceptions about NATO, and review some practical tips.

NATO Overview

In April 1949, 12 countries formed NATO by signing the North Atlantic Treaty in Washington, D.C., to ensure the collective defense of North America and Europe. From its inception, NATO has remained a political and military alliance to prevent conflict. With six expansions from 1952 to 2009, NATO has grown to an alliance of 28 nations, headquartered in Brussels, Belgium. At the Lisbon Summit in 2010, NATO adopted a new strategic concept with three key tasks:

- Collective defense.
- Crisis management.
- Cooperative security.

Another key item from the Lisbon Summit was the commitment to undertake the largest reorganization of NATO command structures to date. When the reorganization is complete, currently planned for 2013, NATO will retain the headquarters in Brussels, supported by two subordinate strategic headquarters: Allied Command Transformation and Allied Command Operations.

Allied Command Transformation

Allied Command Transformation, based in Norfolk, Virginia, will continue to ensure the interoperability and continued transformation of NATO; its roles are parallel to many roles of the former U.S. Joint Forces Command. In addition, Allied Command Transformation oversees the 16 NATO centers of excellence. With functions similar to the U.S. Army Engineer School, the NATO Military Engineering Centre of Excellence is in Ingolstadt, Germany. NATO also maintains the Explosive Ordnance Disposal Centre of Excellence in Trencin, Slovakia, and the Counter Improvised Explosive Devices Centre of Excellence in Madrid, Spain. These facilities are critical resources for training, standardization, and doctrine development.

Allied Command Operations

Allied Command Operations, led by SHAPE in Belgium, will continue to serve as the strategic command responsible for executing NATO operations. At the end of the reorganization in 2013, it will oversee two subordinate joint force commands, to be located in Naples, Italy, and Brunssum, the Netherlands. It is through these joint force commands that NATO will oversee its six ongoing operations. Most familiar to Americans are the International Security Assistance Force (ISAF) in Afghanistan and the Kosovo Force (KFOR) in Kosovo. However, NATO also conducts three other operations:

- Operation Ocean Shield, which provides security to the seas off the Horn of Africa.
- Operation Active Endeavor, which deters terrorism throughout the Mediterranean region.
- NATO support to the African Union, which provides critical support to stabilize Africa.

Additionally, NATO successfully completed the following significant operations in 2011:

- NATO Training Mission–Iraq, which helped develop the Iraqi Security Forces.
- Operation Unified Protector, which helped protect the civilian population of Libya.

Misconceptions About NATO

Not only must we understand NATO to be better contributors to possible future alliance operations, but we must also leave behind several common misconceptions about NATO.

The United States pays 50 percent of NATO costs. This is one of the most common—and most misleading—sound bites I hear. The U.S. share of NATO expenses is currently 22 percent.[1] While the United States contributes the largest single share of the NATO budget, the cost-sharing percentages are based generally on the size of national economies and have been agreed to by all 28 alli-

ance nations. The 50 percent figure often mentioned in the media is more correctly related to the comparison of the U.S. annual defense budget with the budgets of other alliance members. If combined with the defense budgets of all other NATO nations, the U.S. annual defense budget would account for more than 50 percent of defense spending by all NATO nations. The bottom line is that we aren't paying more than half of NATO costs; we are spending more on our own defense than the other 27 NATO countries combined.

NATO countries/forces/personnel don't do anything. This is another favorite complaint of American service members; and again, it is far from the truth. Consider that France (a popular target for U.S. criticism) has approximately 13,000 personnel deployed throughout the world, with half of those in Africa alone. Or that Italy has maintained more than 2,500 personnel deployed to Lebanon since 2007. These are only two examples of numerous ally commitments. The efforts of our NATO allies in these conflict areas have freed the United States to devote resources elsewhere. On a smaller scale, remember that U.S. Army engineers recently renewed the development of several critical capabilities—including mine clearing and the use of mine detection dogs—by learning from allies who have been employing them in conflicts throughout the world almost continually for years. While we may always wish that our allies could do more to support the United States, we need to fully understand what they are already doing to help us.

NATO forces have too many caveats to be effective. This misconception is often quoted by the media in reference to the ISAF operation in Afghanistan. For example, of the 49 nations contributing troops to ISAF, few have provided their forces with no caveats—even the United States provides guidance on the employment of its forces. While some caveats are more restrictive than others, they are a reflection of national political climates, not of the militaries themselves. As Soldiers, we need to respect the capabilities of each military and accept the fact that they operate within the limitations their governments establish, just as we do in the United States.

Americans do all the work on any NATO staff/exercise/operation. Many Americans make this claim, which is simply not true. While most NATO partners will readily acknowledge the hard work and contributions of Americans, they can just as easily point to instances where Americans don't fully appreciate the contributions of other partners. U.S. Soldiers should be proud of their reputation for representing their country well and carrying their share of the workload. However, they should always acknowledge the unique contributions of all NATO partners.

Tips for Success at NATO

Whether you find yourself assigned to a NATO headquarters or leading your platoon on a joint project with a platoon from another NATO country, there are a few simple steps to success in any NATO environment.

Leave the bragging at home. Most NATO personnel are fully aware of U.S. military capabilities compared to their own. You need not remind them of this; NATO is no place for boasting about your own country.

Learn to listen. Many NATO partners have wide experience and would be happy to share with those who will listen. Ask questions to solicit their views; and then listen to their response, only speaking to ask clarifying questions.

Understand what consensus means in NATO. Contrary to what occurs in most American military culture, many NATO meetings are more about building consensus rather than making decisions. All views are considered and valued; decisions often are not delivered until a consensus is reached.

Be thankful you speak English. While many of our allies are forced to learn English to operate in NATO, we don't have to overcome this additional hurdle. Appreciate the efforts of our allies to learn and speak English. Be patient and supportive as you communicate with each other.

Appreciate the long-term views of NATO nations. Americans are routinely characterized as being interested only in short-term goals. Many of our alliance partners take much longer views of issues, big and small. While a bit different from our own, these world views can be particularly helpful in developing solutions to difficult problems.

Go for coffee. This may sound silly, but surprising progress can be made in developing a working relationship by simply sitting down to talk. Get to know your alliance partners in a relaxed setting; your working relationship will go more smoothly from there.

Even if you don't find yourself assigned to a NATO position in the near future, the chances of U.S. Army engineers working with NATO allies continue to increase. Keeping in mind the basic NATO history and structure, dispelling the common misconceptions, and acting on a few practical tips will ensure that your NATO interaction won't leave you feeling as lost and confused as I once was.

Endnote:

[1]NATO Resource Policy and Planning Board, "NATO Common-Funded Budgets and Programmes–Cost Share Arrangements Valid from 1/1/2010 to 31/12/2011," <*www.nato.int/nato_static/assets/pdf/pdf_2010_01/20101102_NATO_common_funded_budgets_2010-2011.pdf*>, accessed on 25 January 2012.

Lieutenant Colonel Becking is an engineer operations officer for NATO at SHAPE, Belgium. He holds a bachelor's degree in mechanical engineering from the University of Michigan and a master's degree in mechanical engineering from Auburn University.

The Human Touch: Geospatial Engineering Meets Local Afghans

By Major Christopher J. Scott

Alpha Company, 4th Special Troops Battalion, 4th Brigade Combat Team, 4th Infantry Division, was responsible for four districts along Afghanistan's border with Pakistan in southern Nangarhar Province. The company inherited the mission of connecting the local population to the government, separating them from antigovernment forces, and improving economic opportunities in the 4,000-square-kilometer area. The company partnered with four district governors, five district police forces, an Afghan border patrol company, and two Afghan National Army infantry companies. It was a challenging opportunity for an engineer company with two platoons, an attached platoon of military police Soldiers, and a pair of howitzers.

After 60 days in theater, it was obvious that there was still a large fundamental gap in knowledge of the cultural geography in the company area of operations. Geospatial intelligence provided a comprehensive representation of the physical terrain, but we did not know local naming conventions to describe small villages inside the district boundaries. The local population used the names of small villages, rather than political district boundaries, to describe locations, thereby hampering the effectiveness of local reporting. Also, our contact with local leadership ended with the appointed district governor. With tribal leadership such a driving force in Afghan society, we knew that communicating with the elders was essential to understanding the disconnected populace. We needed access, and we needed it in concert with the district governors.

Solution

Operation Jantacular was developed as a 45-day survey program to meet over breakfast with the elders of each village to produce a geodetic product representing the human terrain in our area of operations. *Jantacular* is a British term for breakfast, which was appropriate for our intent. The aim was to meet with the leaders of one village daily. This would allow us to get the data to complete the survey, which would help us understand the fundamental challenges and let us spend more of our deployment time tackling them. Entering the data into the geospatial intelligence database would ensure that the information lived beyond our deployment.

Preparation

It was decided that three to four village elders would be the right size group, large enough to feel comfortable among Americans, but small enough to discourage sidebar conversations. Our civil-military Jantacular Team was composed of an American civilian law enforcement professional, a district support team (composed of representatives from the U.S. State Department and U.S. Agency for International Development), the company intelligence team leader, platoon leaders (if available), and the company commander. At least one interpreter attended to facilitate the mission. It quickly became apparent that choosing the right interpreter and maintaining consistency were important for success. "James" was our best interpreter, able to anticipate issues with less direction from us.

The primary district governor in the Khogyani tribal region provided us with initial information, describing the names and general location of the 44 villages in our four districts. He pointed them out on our tactical operations center wall map, which we roughly outlined. He set up meetings with village elders, as did his counterparts in the other districts. Their cooperation was essential and greatly appreciated.

An engineer Soldier provides security during a meeting with tribal leaders.

Large printouts of each village, without any added graphics or layers, formed the centerpiece for our discussions. The village elders understood the imagery much better when it was oriented on a horizontal surface, rather than hanging on the wall. Once, after an especially grueling 2-hour session, all of our work had to be redone when the elders discovered that we had not oriented the mountains on our imagery toward the real Tora Bora Mountains and all the features had been identified at the wrong end of the map.

We contracted to have a traditional breakfast of flatbread, sweet cream, water, and tea to serve our guests when visiting elders came to the gate of our forward operating base. This flexibility was important since the visitors often arrive an hour early or 2 hours late.

By hosting the meeting at our base (and occasionally providing travel reimbursement), we could conduct Jantacular Team meetings whenever the locals were available. Meetings did not affect our patrol schedule or require manpower outside of the team.

Execution

The company intelligence support team and an interpreter escorted the elders from the front gate to the meeting room, where we made introductions, engaged in small talk, and exchanged cell phone numbers. Refreshments were served as we began talking about their village. The best meetings began with questions about local history, giving the leaders a chance to brag about their village. For mapping, we tried to distinguish the boundaries of the village first; and then we helped the elders find their own *qalats* (walled living compounds), on the map. Anyone who has spent hours exploring Google Earth™ knows how much fun this can be. Once they found their own homes, the elders were usually well oriented to the imagery and could identify the locations of hospitals, schools, mosques, powerful families, and terrain features such as hills and streams.

Output

Once an initial map survey was complete, the data was transcribed into the Tactical Ground Reporting System. This turned grid coordinates into a village name, which allowed the operations center to assist in battle tracking and to coordinate with the Afghan National Police. It also facilitated "tip line" operations by translating a village name into grid coordinates for U.S. patrols. Communication with local nationals improved when we could use their local village names to narrow down the location of a story rather than using vague descriptions such as "2 miles from the old, burned-out Russian tank" as landmarks. Additionally, we created a PowerPoint® map of our operating environment, which was useful for describing various village metrics in reports to higher headquarters.

Once the maps had been transcribed internally, we shipped them off to the brigade geospatial intelligence cell for data entry. The geospatial intelligence cell then provided us with a new tactical operations center map, complete with village boundaries, locations of hospitals and mosques, and local names of major terrain features. They also provided high-resolution imagery of each village, which was compiled in binders for patrol leaders to take on missions. This document was very helpful in gathering information from local nationals and using the air-to-ground integration of intelligence, surveillance, and reconnaissance information during cordon-and-search missions.

Conclusion

Operation Jantacular provided information that the company used to drive most of its follow-on missions, and the data it produced facilitated a successful battlefield hand-off at the end of the deployment. Without the initial survey, we would have continued business as usual and left the follow-on unit with the same knowledge gaps that had been passed down for nearly a decade.

Major Scott was the commander of Alpha Company during its deployment in Nangarhar Province, Afghanistan. He currently serves in the Pittsburgh District, Lakes and Rivers Division of the U.S. Army Corps of Engineers. He is a graduate of the Engineer Officer Basic Course, the Engineer Captains Career Course, and the Topographic Officer Management Course. He holds a bachelor's degree in historic preservation from the University of Mary Washington in Fredericksburg, Virginia.

Brilliant Scenes:
Army Engineers in the Overland Campaign

By Mr. Donald J. McConnell and Mr. Gustav J. Person

The Overland Campaign of the Civil War began on 4 May 1864 and lasted 45 days. Stalemated at almost every turn, Lieutenant General Ulysses S. Grant continually attempted to sidestep General Robert E. Lee's right flank as the forces moved south until the two armies came to rest and entrenched at Cold Harbor, Virginia. Grant changed his strategy thereafter by marching across the Chickahominy River, crossing the James River unopposed, and attempting to seize the Confederate transportation hub at Petersburg, Virginia, on the Appomattox River. This article examines the operations of Company A, U.S. Engineer Battalion, during the campaign, especially its actions on 14 June 1864 when the battalion assisted the Engineer Brigade of the Army of the Potomac erect a ponton bridge across the James River. The second part will examine the demographics of the unit, based on a study of the relevant muster rolls and the service and pension records of the officers and enlisted men assigned to the company at that time.

The Overland Campaign

Company A was originally formed as the Company of Sappers and Miners at the beginning of the Mexican War on 16 May 1846, with an authorized strength of 150 engineers. It was organized at West Point, New York, and ordered to Mexico. The unit rendered distinguished service in that conflict during the campaign to capture Mexico City. It engaged in reconnoitering and constructing fortifications and battery positions and served as infantry at the battles of Molina Del Rey and Chapultepec.[1, 2]

In August 1861, the company was expanded into a battalion of four companies and the original unit was restyled Company A. Although the official name adopted was the Battalion of Sappers, Miners, and Pontoniers, it continued to be known as the U.S. Engineer Battalion in most orders and correspondence. Battalion strength was authorized at 600 officers and men. Company B was recruited in Portland, Maine, and Company C in Boston, Massachusetts. By 1 July 1862, however, the battalion only numbered 276 men on the rolls. That November, Company D (organized from drafts of the other three companies) joined the battalion, but all companies remained short of men until the War Department authorized Regular Army units to recruit from volunteer regiments in October 1862.[3]

In the closing stages of the Overland Campaign, the opposing armies were stalemated east of Richmond around Cold Harbor 1–12 June 1864. The regular engineers left

Photo courtesy Library of Congress

This photo of the James River ponton bridge, taken by Timothy O'Sullivan from the north bank, shows trestle work and anchoring schooners.

their camp on 12 June and crossed the Chickahominy River on a ponton bridge erected by the 50th New York Volunteer Engineers. They arrived at Weyanoke Point on the James River at about 1400 on 14 June. The regulars started work on a 150-foot-long trestlework through the muddy marshes and began assembling the ponton bridge with two companies on each bank. Concurrently, the infantry Soldiers from three Army corps began ferrying across the river farther upstream. Construction of the bridge began at about 1600 and took 7 hours to complete. The bridge stretched 2,170 feet and incorporated 101 ponton boats.[4, 5, 6, 7]

The bridge was in operation until 17 June. All artillery, cavalry, wheeled vehicles, and trains of the Army of the Potomac—plus a herd of 3,000 cattle—crossed without incident or the loss of a single wagon or piece of artillery. It was, as *The New York Times* reported, ". . . one of the most brilliant scenes of the war."[8] Following its disassembly, the components were towed upriver to City Point, Virginia. Meanwhile, the assault on Petersburg on 15 June was successful, but an untimely halt in the operation allowed the Confederates to seal the breach. Three days later, the Army of the Potomac settled down to a siege of the Confederate defenses for the next 9 months.[9]

While the crossing proceeded, the Engineer Battalion moved out of the bridgehead on 16 June on an 18-mile march that took them closer to the new siege lines. In the following weeks, personnel reconnoitered and surveyed the enemy lines, built artillery batteries and fortifications, and conducted various mobility operations.

Photo courtesy Office of History, U.S. Army Corps of Engineers

Captain George H. Mendell

The Company

When Congress created the battalion in August 1861, it failed to allow for a command and staff element. Consequently, command of the battalion usually devolved on the senior officer; in June 1864, this was Captain George H. Mendell, who also commanded Company B. Captain Mendell graduated from the U.S Military Academy in 1852. After the Overland Campaign, he was

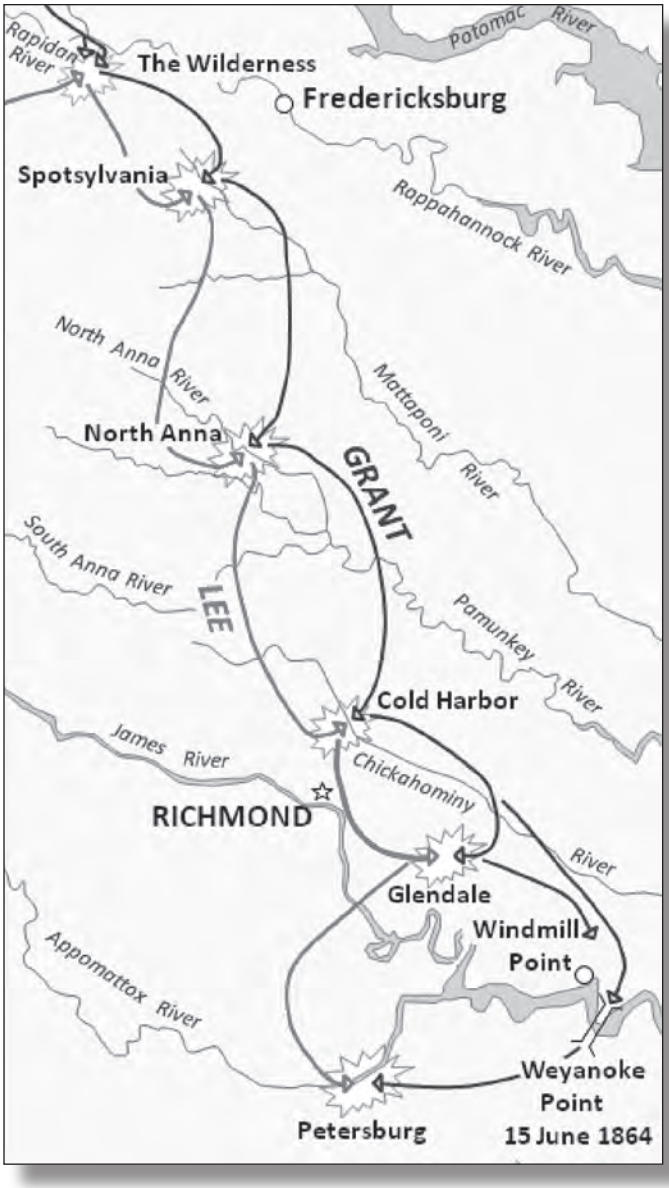
Photo courtesy Library of Congress

Company A Soldiers pose at Petersburg, Virginia, in August 1864.

promoted to major and received a brevet promotion to lieutenant colonel for distinguished service during the recent campaign on 15 August 1864.[10]

Throughout most of June 1864, only five officers were assigned to the battalion; and because these officers were often employed on detached engineer duties, the four companies were usually operationally commanded by noncommissioned officers.[11, 12, 13, 14]

During the latter part of the campaign, First Lieutenant William H.H. Benyaurd, commander of Company A since 10 June, also served as battalion adjutant. First Lieutenant Benyaurd, a native of Pennsylvania, graduated from the U.S. Military Academy in 1863. He received a brevet promotion to captain on 1 August 1864 for meritorious service during the Overland Campaign. In 1897, he was awarded the Medal of Honor for gallantry at the battle of Five Forks, Virginia, on 1 April 1865.[15]



Map courtesy of Master Sergeant Paul Jenkins, U.S. Army (Retired)

The Overland Campaign, May–June 1864

Photo courtesy Office of History, U.S. Army Corps of Engineers

First Lieutenant William H.H. Benyaurd

During the war, Company A experienced three large strength changes. In July 1862, the company lost 22 men on transfer to the other companies in the battalion. In late October 1862, the company received a total of 61 Soldiers who transferred from various state volunteer regiments. Finally, 30 Soldiers reenlisted en masse at the winter camp at Brandy Station, Virginia, in February 1864.[16]

By the end of May 1864, Company A was at half strength. The aggregate strength was 106 enlisted men and one officer, but only 84 were present for duty. Duty in the field and sick men being treated locally further cut the available company strength to just 78.[17]

The histories of three Soldiers help describe the varied backgrounds of Company A Soldiers. The first was Edwin Austin, a 22-year-old clerk from New York City. Austin was a combat veteran who enlisted in November 1860 and was shot through the right lung while crossing the Chickahominy River in June 1862. He was discharged for disability that October; but by February 1864, he had recovered sufficiently to reenlist in his old unit. Private Austin would survive the war, eventually marrying and settling in Washington, D.C.[18]

Although on detached duty at Portland, Maine, since 1863, Frederick Gerber, a German immigrant and Mexican War veteran, was carried on the wartime muster rolls as the assigned company first sergeant. He served at Portland on recruiting duty after suffering from "Chickahominy fever" (malaria) and scurvy. In November 1871, Gerber was awarded the Medal of Honor for 32 years of gallant and distinguished service. He was the first engineer Soldier to be so honored.[19]

The service record of Corporal William Collins does not reflect the qualities he demonstrated to earn his promotion, but he obviously overcame serious problems. A New York native, Collins enlisted in the company in December 1853 at the age of 22 and reenlisted in December 1858. In March 1861, Collins went over the hill and was not caught until 3 years later. Returned to the company on 22 March 1864, he was tried by court-martial, sentenced to make good the time lost to desertion, and demoted to private. Clearly, Collins must have made a choice to live up to his responsibilities. He was promoted to artificer[20] on 1 May and to corporal on 10 June. Collins would become a sergeant before leaving the service in January 1865, although he does not appear to have served out the remainder of the time lost to desertion.[21]

At the beginning of the Civil War, the Regular Army was largely filled with immigrants. The Irish, followed by the Germans, were the predominant immigrant groups. The preenlistment occupations for these Soldiers ran the gamut of most trades in the mid-19th century. Farmers headed the list, followed by laborers. Most occupations in the company were not engineer-specific. There were only six blacksmiths, four boatmen (a skill desirable for engineers doing ponton boat work), 11 carpenters, and four masons/stone cutters. The three shoemakers and one tailor undoubtedly assisted in keeping uniforms and leather equipment in serviceable condition.[22] The company muster rolls for the period, certified by Captain Mendell, noted that the discipline, instruction, military appearance, arms, accoutrements, and equipment were all rated as "good." At least four men of the original company group were commissioned during and after the war.[23]

Desertion posed a constant problem for the Regular Army during the 19th century. Company A, however, was notably cohesive. Despite the hardships of the campaign, not a single Soldier deserted in May or June 1864. Fortunately, the company experienced no combat-related casualties during the campaign. This fact, however, should not detract from the sterling work and devotion to duty rendered by this outstanding engineer unit.

Endnotes:

[1]Clayton R. Newell and Charles R. Shrader, *Of Duty Well and Faithfully Done: A History of the Regular Army in the Civil War*, University of Nebraska Press, Lincoln, Nebraska, 2011, p. 286.

[2]Thomas Turtle, *History of the Engineer Battalion, Read Before the Essayons Club of the Corps of Engineers, DEC 21st 1868*, Battalion Press, Willets Point, New York, 1868, No. VIII, Printed Papers, pp. 1–2.

[3]Newell and Shrader, pp. 287–289.

[4]Turtle, p. 8.

[5]Lieutenant General U.S. Grant, "Dispatches, 14 June 1864," *The New York Times*, 16 June 1864.

[6]Gilbert Thompson, *The Engineer Battalion in the Civil War*," Press of the Engineer School, Washington Barracks, D.C., 1910, pp. 68–70.

[7]Captain George Mendell's Report, 5 August 1864, in U.S. War Department, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, Government Printing Office, Washington, D.C., 1891, Series 1, Vol. XL, Part 1, pp. 300–301.

[8]Special Correspondent, *The New York Times*, 17 June 1864.

[9]Thompson, p. 70.

[10]Francis B. Heitman, *Historical Register and Dictionary of the United States Army, From Its Organization, September 29, 1789 to March 2, 1903*, Government Printing Office, Washington, D.C., 1903, p. 702.

[11]Newell and Shrader, p. 290.

[12]*U.S. Returns from Regular Army Infantry Regiments, 1821–1916 (database on line) Provo, Utah: <www.Ancestry .com>* (hereinafter *Regimental Returns).*

[13]National Archives and Records Administration (NARA) Microfilm Publication M665, Rolls I-244, pp. 297–300.

[14]Records of the Adjutant General's Office, 1780s–1917, Record Groups (RG) 94 and 391.

Photo courtesy Library of Congress

The 1864 winter camp of the U.S. Engineer Battalion at Brandy Station, Virginia.

Photo courtesy Burk and McFetridge[24]

The U.S. Engineer Battalion stand of colors was issued in 1866.

[15]Heitman, p. 213.

[16]*Register of Graduates*, Association of Graduates, West Point, New York, 2000, pp. 4–42.

[17]Records of the Adjutant General's Office, 1780s–1917, *Muster Rolls of the Regular Army Organizations, 1784–October 31, 1912, NARA*.

[18]*Regimental Returns*.

[19]Soldier's Certificate No. 128014, NARA, *Civil War Pension Index: General Index to Pension Files, 1861–1934*, (database on line) Provo, Utah: *<www.Ancestry.com>*.

[20]Eugene V. McAndrews, "Sergeant Major Frederick Gerber, Engineer Legend," *The Military Engineer*, No. 414, July–August 1971, pp. 240–41.

[21]An artificer was an enlisted Soldier with special technical skills. Artificers earned $4 more than the $13 earned by ordinary privates.

[22]*U.S. Army Register of Enlistment*, 1798–1914, Provo, Utah: *<www.Ancestry.com>*, Register of Enlistment in the U.S. Army, 1798–1914, NARA, Microfilm Publication M233, Records of the Adjutant General's Office, 1780s–1917, RG 94.

[23]Ibid.

[24]*Flags of the Army of the United States Carried During the War of Rebellion, 1861–1865*, Burk and McFetridge, Philadephia, Pennsylvania, 1888.

Mr. McConnell is a graduate of the Naval Postgraduate School and the National War College. He now works for the Department of Defense.

Mr. Person is the installation historian at Fort Belvoir, Virginia. He has bachelor's and master's degrees in history from Queens College in New York City.

Dedication

The following members of the Engineer Regiment have been lost in overseas contingency operations since the last issue of *Engineer*. We dedicate this issue to them.

Private First Class Adam E. Dobereiner	937th Route Clearance Company, 8th Engineer Battalion, 36th Engineer Brigade	Fort Hood, Texas
Sergeant Brian J. Leonhardt	713th Engineer Company (Sapper), 113th Engineer Battalion, 81st Troop Command	Valparaiso, Indiana
Sergeant John A. Lyons	572d Engineer Company, 8th Engineer Battalion, 36th Engineer Brigade	Fort Hood, Texas
Specialist Christopher A. Patterson	713th Engineer Company (Sapper), 113th Engineer Battalion, 81st Troop Command	Valparaiso, Indiana
Specialist Robert J. Tauteris Jr.	713th Engineer Company (Sapper), 113th Engineer Battalion, 81st Troop Command	Valparaiso, Indiana

PIN: 102545-000