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Front cover: Soldiers assigned to the 510th Route Clearance Company, 20th Engineer Battalion, conduct a route clearance patrol in Kandahar City, Afghanistan.

Back cover: A bridging crew with the 50th Multirole Bridge Company, 5th Engineer Battalion, 4th Maneuver Enhancement Brigade, waits as a CH-47 Chinook uses a sling load method to lower a bridge bay during a combined arms gap-crossing exercise.

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Clear the Way

Brigadier General Anthony C. Funkhouser
Commandant, U.S. Army Engineer School



Greetings from your U.S. Army Engineer School and regimental headquarters. I am proud to report that the Engineer Regiment continues to provide opportunities now and into the future despite budget cuts and personnel reductions. In this issue, I want to present you with an update on our progress in the brigade engineer battalion implementation efforts and in talent management of the Engineer Regiment.

Command Sergeant Major Butler J. Kendrick, Jr., Chief Warrant Officer Five Scott R. Owens, and I recently attended the Army Training and Leader Development Conference, where Chief of Staff of the Army General Raymond T. Odierno and other senior leaders spoke to us about the way ahead for the Army. General Odierno discussed the challenges of current budget cuts and the looming potential for sequestration in 2016 while we face a very complex and dangerous world filled with many threats. He explained that the three major areas impacting the Army budget are readiness, modernization, and end strength. The Army is challenged with balancing these three areas without significantly impacting our ability to respond to mission requirements. We have to maintain a level of training readiness to respond around the world or domestically while maintaining our technological advantages in modernization against present and future threats.

We also have to maintain the right structure in our Army across all components. Here is where the hard decisions are being made to reduce our end strength. Through these changes, the Army is shifting away from a force based on requests for forces with an Army force generation cycle to a more expeditionary, regionally aligned force that is focused on deterring, preventing, and shaping the world and, when asked, fighting and winning our Nation's wars.

We are shaping the Engineer Regiment now and for the future to meet the intent of the Chief of Staff of the Army. We are in the midst of activating the brigade engineer battalions within the brigade combat teams. At the same time, we are looking at echelon-above-brigade companies and future structure as the Army lays the foundation for Force 2025. We have to ask ourselves: What are the threats and technologies that will influence how we fight? As the proponent of the Engineer Regiment, we are developing organizations to support the maneuver commanders with well-trained engineers who possess the right technical and tactical skills; use the most modern equipment; and employ sound, current doctrine. These organizations must be led by competent and confident leaders of character who understand the capabilities of their organizations and can employ them across the full range of military operations.

We continue to capture the current lessons learned, particularly at the combat training centers (CTCs), where we are executing decisive action. We are taking these lessons and exchanging information among the Engineer School, the CTCs, all Army components, and many other agencies. We are focusing on where we need to make changes to improve. Many of these lessons are being adopted into our professional military education courses.

General Odierno and General David G. Perkins, U.S. Army Training and Doctrine Command commander, have placed great emphasis on leader development and talent management. In the institution—our schoolhouse—we are adaptively capturing the lessons learned from the CTCs and the operational units as we focus on decisive action training. We are sharing the lessons in our Engineer Captains Career Course, precommand courses, and the Noncommissioned Officer Education System to ensure that engineer leaders are aware of gaps in their knowledge and experience. We have to help create leaders who are adept at engineer tactical and technical skills at the organizational level but who can also operate at the strategic level with a knowledge of Army, joint, interagency, intergovernmental, multinational, industry, and academia capabilities and

". . . the Army is shifting . . . to a more expeditionary, regionally aligned force that is focused on deterring, preventing, and shaping the world and, when asked, fighting and winning our Nation's wars."

processes. The growing complexities of our world and the accelerating pace of technologies demand engineer leaders with broadened talents. We cannot maintain the current "one size fits all" personnel management system.

Department of the Army Pamphlet 600-3, *Commissioned Officer Professional Development and Career Management*,[1] is being revised. It is pending release in September 2014 and will place greater emphasis on broadening opportunities. As the commandant of the U.S. Army Engineer School, I have worked with the U.S. Army Human Resources Command to change the dynamic of where we focus. We are focused on unit leaders to find the right positions for leaders who are completing company command, majors who are completing their key developmental positions, and lieutenant colonels who are completing centralized selection list command as they prepare to serve in broadening assignments. Chief Warrant Officer Five Owens and Command Sergeant Major Kendrick are identifying broadening opportunities for warrant officer and NCO leaders as well. The goal is to place our leaders in the best broadening positions for their talents.

For our commissioned officers, one recent example has been our effort to maximize the number of engineer officers applying for the many Department of Defense and Department of the Army fellowships. In the past, only three or four engineers have been selected annually from those who apply. This year, we worked with the U.S. Army Human Resources Command to identify potential officer candidates and leveraged leaders to engage with them and recommend that they apply for fellowships. As a result, 12 officers were selected as primaries and two were selected as alternates for fellowships this year. Nearly 57 percent of the officers selected were among those targeted by the senior leaders from the Regiment. This was an overall increase of 300 percent over fiscal year 2013. We also had four officers selected for Training With Industry opportunities this year, with follow-on use at the U.S. Army Corps of Engineers (USACE) or the Engineer School. We have expanded our developmental assignments with USACE, special operations forces, and the National Geospatial-Intelligence Agency. We are also reviewing files for the best candidates to be observers/controllers, small-group leaders, associate professors of military science, and Active Army/Reserve Component recruiters and those to be recommended for advanced civil schooling.

Our latest initiative has been to infuse decisive-action experience in officers before they assume company command. With command queues around 2 years, we are taking high-performing future commanders who are graduating from the Engineer Captains Career Course and assigning them to the Sidewinders at the National Training Center for a year, where they will be able to observe, train, and learn from the tip of the spear. Then they will move on to their brigade engineer battalion, where they will bring a year of experience into command. These initiatives are a concerted effort to broaden future leaders of the Regiment.

Our talent management initiatives are not only for officers. We are also exerting a great deal of effort to expand the credentialing and educational opportunities for warrant officers and senior NCOs. We are working to increase the technical competencies of leaders as our branch continues to expect more from them since they may be serving in expeditionary forces around the world. The latest initiative coming to fruition is the effort to train the first warrant officers and NCOs for the following credentials:

- Certified construction manager.
- Project management professional.
- Certified assistant in project management.
- Certified manager.

The U.S. Army Training and Doctrine Command has been very supportive this year, and we will see the results as leaders begin taking the credentialing exams.

The toughest part of talent management has been the need to reduce our end strength. The officer and NCO separation boards and early retirement boards have been hard-hitting on many year groups. It has affected many at the personal level, and we are doing everything we can to assist in their transition. They have served honorably, and we thank them for their service. Since nearly 75 percent of the Engineer Branch is in the Army National Guard and U.S. Army Reserve, there are still opportunities for many of those Soldiers transitioning from the Regular Army.

As you can see, the Engineer Regiment continues to make great progress and offer many opportunities. It is up to our leaders to take advantage of the opportunities best-suited for them and for our leaders to stay engaged with the Engineer School as we capture lessons learned and forge the future. Thanks for all that you and your Families do each and every day for our Nation and Army. *Essayons!*

Endnote:

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



Lead the Way

Command Sergeant Major Butler J. Kendrick, Jr.
Regimental Command Sergeant Major



It is my pleasure to speak again with the great Soldiers, civilians, and Families of our engineer profession. Lots of things have been going on since we last spoke, but I will gather some of the highlights from my perspective. If it's not in this article, our Engineer School Knowledge Network site is a great resource for real-time news about the Engineer Regiment.[1]

The last couple of months have been packed with great training events and the Engineer Regiment is consistently moving forward. Brigadier General Anthony C. Funkhouser and I visited the commandants of the French and German army engineer schools, Lieutenant General Patrick Alabergère and Brigadier-General Heiko Krogmann, at their respective schools. We received an overview of their commissioned and noncommissioned officer courses, discussed capabilities, and considered future combined North Atlantic Treaty Organization training opportunities. Then we moved to a very emotional part of the trip when we gave due respect to our World War II veterans at Omaha Beach in France, where the Allies suffered approximately 9,000 casualties in 1 day. To be on this hallowed ground was sobering and a great honor. The ceremony dedicated a recently renovated plaque, followed by remarks by Brigadier General Funkhouser and Mr. Herbert "Andy" Anderson. Andy served in the 348th Engineer Combat Battalion, which was part of the 5th Engineer Special Brigade. He landed on Omaha Beach on D-Day and served as a machine gunner.[2]

We then packed our bags and traveled to Grafenwoehr, Germany, to visit the Regiment Engineer Squadron, 2d Cavalry Regiment, which is led by Lieutenant Colonel Alexander G. Deraney and Command Sergeant Major Curtis D. Hopkins, and the 15th Engineer Battalion command team of Lieutenant Colonel Sean H. Kuester (outgoing), Lieutenant Colonel John C. Goetz (incoming), and Command Sergeant Major Chad C. Blansett.

Major General Leslie C. Smith, commanding general of Fort Leonard Wood, Missouri, and the Maneuver Support Center of Excellence, and Command Sergeant Major Terrence W. Murphy, post command sergeant major, led the celebration of the Army's 239th birthday by leading a post level, 4-mile run. The Engineer Regiment also had its own unique run on 16 June as engineers on Fort Leonard Wood participated in another 4-miler to honor the Regiment's 239th birthday.

In June, I attended the U.S. Army Corps of Engineer (USACE) District Engineer Precommand Course. Under the leadership of Colonel Paul B. Olsen, USACE, Norfolk District commander, the course provides a magnificent amount of knowledge and information about USACE. It was a great venue to learn how USACE operates daily, how it meets the requirements of combatant commands, and how it provides mission command for activities in the area of operations. Mentorship was provided by some of my previous leaders: Brigadier General Kent D. Savre, USACE, North Atlantic Division commander; Brigadier General Michael C. Wehr, USACE, South Pacific Division commander; and Brigadier General Richard G. Kaiser, incoming USACE, Lakes and Rivers Division commander. Lieutenant General Thomas P. Bostick, Chief of Engineers and commander of USACE, and the staff vastly increased my knowledge about USACE functions and structure across the globe. We are studying the establishment of an even closer relationship with the commanders and command sergeants major to enhance some of our great talent across the Engineer Regiment and develop partnerships with USACE during some of its many projects.

We've been diligently pursuing credentialing opportunities for the last year as one of our leader initiatives, with emphasis on our NCOs. I want to highlight the programs that are being spearheaded under a pilot program at Fort Leonard Wood, led by Sergeant Major Jon P. Meyer, Directorate of Training and Leader Development. The certifications being pursued and their current enrollments include—

- Project management professional (13 commissioned officers, 4 warrant officers, and 8 NCOs).
- Certified associate project management (3 NCOs).
- Certified manager (10 NCOs).
- Certified construction manager (1 commissioned officer and 1 NCO).

These great opportunities are provided at Fort Leonard Wood, but credentialing opportunities are also available online.[3]

(continued on page 24)

Show the Way

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



Brigadier General Anthony C. Funkhouser, Regimental Command Sergeant Major Butler J. Kendrick, Jr., and I recently attended the Army Training and Leader Development Conference sponsored by General Raymond T. Odierno, Chief of Staff of the Army, at Alexandria, Virginia. The annual conference brings senior Army leaders together to discuss strategic initiatives and issues impacting the Army today and in the future.

We discussed many of the items that have been in the news lately, including the Army drawdown, budgetary challenges, training and leader development, equipment of the force, and regionally aligned forces. What struck me with the most force were the comments by General Odierno, who talked about the three Cs—character, competence, and commitment. He said that character is the most important to him and that people sometimes tend to overlook character flaws in individuals who are extremely competent. I believe that tendency is one of the things leaders must take into consideration when shaping their command climate and managing their leader development plans. Character and competence should not be mutually exclusive, and it is generally easier to develop competence than it is to fix inherent character flaws. Leader actions must be consistent with the Army values, and leaders must recognize and address traits in their subordinates early on. But to make long-lasting impacts, this effort must begin at the junior leader level. Sergeants and company grade commissioned officers and warrant officers are the first-line leaders who supervise the Army's newest Soldiers, and they are the role models who will imprint upon the minds of those Soldiers what a leader is.

I often think back to my first unit and the leaders who started me off on my path. I was a private first class; and the commander and first sergeant welcomed me into the company on my first day, asked questions about my family and me, and offered assistance while settling in. Coming straight out of basic training and advanced individual training, meeting my company leaders that first day was refreshing and left a positive impression on me. It didn't end there. The first day in my section was a similar experience. I met my squad leader, section sergeant, section warrant officer, section sergeant major, and the officer in charge. All welcomed me to the team, which helped to reduce the anxiety I felt before signing in. Over the course of my years in that unit, I learned a lot from my peers and my leaders. I gained experience and skill in my military occupational specialty, attended my first leadership course at the Noncommissioned Officer Academy, and went to a promotion board. But the most important thing I learned during the assignment was the difference that good leadership makes. That lesson was reinforced by my observations of some of my peers in other units on the installation. Some of my classmates from advanced individual training who went to different companies on post were not as fortunate and did not have the same quality of leadership that I had. Over the course of my career, I have seen my fair share of leaders who were lacking in character in some way, but I am very happy to report that they have been few. Usually, the Army has weeded them out along the way.

Senior leaders set the climate for their organizations, but it's the junior leaders who interact with our most impressionable Soldiers from day to day. Sergeants and company grade commissioned officers and warrant officers need to develop, manage, and execute their own leader development strategies, modeled after the good leader development strategies of their own superiors. Be the correct example for your Soldiers. (You know they are watching you closely.) Help steer them and keep them on the correct path in their professional and personal lives. Develop them while they are still impressionable and moldable so that they can grow to be the leaders of character tomorrow. Ask yourself, "What is my leader development strategy?"

The last C—commitment—also resonated with me. General Odierno sees it as commitment to Soldiers, the mission, and the institution. He said that we must change the perception that assignments to U.S. Army Training and Doctrine Command, combat training centers, and other organizations that are not in U.S. Army Forces Command are not desirable or promotion-enhancing. That perception is false and based on older, historical tendencies to send the Army's less capable individuals to those assignments. Those Soldiers were not inherently competitive for promotion in the first place. But over the past several years,

". . . even though the Army will undergo significant challenges . . . I am confident that we will not fail. We will not fail because of the one resource that really matters—you, the Soldier, who always finds ways to get the mission done."

the opposite has been happening. The Army is sending its most experienced and capable leaders to those assignments, where they are getting promoted based on their performance and broadened portfolios. He emphasized that these are important, broadening, and career-enhancing assignments. He directed that we send our best Soldiers to them because those individuals have the most to give and can have an impact on larger populations at critical junctures in their careers.

So I ask: What are you committed to? What is your commitment level? Think about those questions for a moment. When we signed up, we all committed to the Army and to our role as protectors and defenders of the Nation and Constitution, but what does that commitment really mean and how does it drive you? Somewhere along the way in our careers, we undergo a shift in thinking, usually accompanied by increases in rank and responsibility. Our focus begins to broaden from our own personal goals. We begin to think of our contributions to the greater mission and the organization and to our increasing and expanding roles in training, developing, and leading Soldiers. We start to realize that we aren't merely doing a job; we are professionals honing our craft for a cause greater than ourselves. That's when we really begin to understand what commitment means and to assess ourselves, our paths, and our responsibilities more deeply.

Which brings me back to my second question: What is your commitment level? Another way to phrase this is: What sacrifices am I willing to make? Are you willing to accept a U.S. Army Training and Doctrine Command assignment, knowing that it will take you out of your comfort zone where you've spent 10, 15, or 20 years honing your craft? I submit that if you are truly committed, you will jump at such an opportunity. The Army is committed—it's committed to you. It invested time and money to train and develop you, and the Engineer School needs your experience and knowledge to help shape the Engineer Regiment for the future. And the best part is that such an assignment is actually very rewarding on a personal level and a professional level. I admit that I was not thrilled when told I was being assigned to the U.S. Army Engineer School. I liked serving in the force where I applied my trade every day. I was in my comfort zone and was quite content to stay there. Before serving at Fort Leonard Wood, Missouri, I had only attended training here, which was a very different experience from working and living here full time with my Family. Now, I've experienced firsthand the difference one can make while serving at the schoolhouse, especially with the help of the professional team of military personnel, civilians, and contractors working here. The experience has really broadened me. It helped me gain a strategic vision of the Army, and it exposed me to how the Army runs. And I figured out how to navigate the halls of the Pentagon—now that I've deciphered the numbering system in the building!

I challenge you to seek those opportunities that give back to the Army and to help shape its future. Seek a position in the schoolhouse, and bring your experiences and expertise to the processes that shape the Engineer Regiment. Show your commitment to the total Army, not just to U.S. Army Forces Command.

In closing, I echo the words that General Odierno used in his closing comments for the conference. Great change brings great opportunity; and even though the Army will undergo significant challenges in the years to come, I am confident that we will not fail. We will not fail because of the one resource that really matters—you, the Soldier, who always finds ways to get the mission done. You get it done through ingenuity and great leadership. To quote General Odierno, "We do things on a routine basis that most people would struggle to do."[1] I think that quote effectively sums up what we do, and have always done, for the Army. Let us try!

Until we meet again, stay safe. *Essayons!*

Endnote:

[1]Raymond T. Odierno, Army Chief of Staff, speech given at Army Training and Leader Development Conference, Alexandria, Virginia, 17 July 2014.





Employment of Brigade and Task Force Engineers: Part II

Tips, Techniques, and Procedures

By Colonel Jason L. Smallfield

The first part of this article, "Employment of Brigade and Task Force Engineers," was published in the May–August 2014 issue of *Engineer*.[1] It analyzed the Engineer Regiment over the past 30 years based on doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF). This DOTMLPF analysis is key to understanding where the Regiment has been, where it is, and where it is going. Understanding these three data points is key because the following 13 tactics, techniques, and procedures (TTP) will mean different things to the three generations of leaders currently within the Engineer Regiment. To the generation of the Engineer Restructuring Initiative (ERI), the TTP are reminders. To the generation of the War on Terrorism and overseas contingency operations, they may offer a way to add proven combined arms maneuver TTP to the lessons learned in combat. Finally, the TTP are a way to teach proven methods to the generation that came after the War on Terrorism and overseas contingency operations.

Mission Command

The most important component of the brigade engineer battalion (BEB) is mission command. The BEB commander is the brigade engineer and has a permanent representative—the assistant brigade engineer—assigned to the brigade combat team (BCT) staff. The BEB commander is the senior engineer within the BCT and is the final voice to the brigade commander on engineer-related issues. The assistant brigade engineer helps the brigade engineer develop and provide recommendations to the brigade commander within the framework and intent provided by the brigade engineer. The key is to have the right mission command and task force engineer structure that will allow the BCT to effectively plan for, receive, employ, and return echelons-above-brigade (EAB) assets. A way to formalize the brigade engineer/assistant brigade engineer relationship is to have the brigade engineer rate the assistant brigade engineer with the brigade commander as the senior rater.

Brigade Engineer

The BEB commander retains a linkage to the BCT regardless of echelon-above-brigade engineer organizations assigned to the BCT area of operations. Because the engineer battalion provides limited engineer capability, a BCT will likely be reinforced with varieties of unique engineer companies, an engineer battalion, or engineer brigade. However, this engineer reinforcement is temporary and the assigned BEB commander should always retain brigade engineer status for purposes of continuity and familiarity with the brigade commander and staff.

Command and Staff Responsibilities

The brigade engineer must balance command responsibilities with staff responsibilities. Overemphasis on either may be necessary in the short term but must be avoided in the long term. The assistant brigade engineer must consistently obtain guidance from the brigade engineer and keep the BEB staff informed throughout the brigade military decisionmaking process. The harder balance is the BEB staff role with regard to the military intelligence and signal companies; the chemical, biological, radiological, and nuclear platoon; and any other enablers that are task-organized under the BEB. A BCT commander is blind and dumb without the capabilities provided by the military intelligence and signal companies; therefore, these capabilities should be the priority of the BEB commander. The BEB commander and staff must have a good understanding of the capabilities, limitations, and employment considerations to ensure that the enablers can accomplish their assigned tasks.

Nearly Simultaneous BCT and Engineer Battalion Operation Orders

The BEB should publish its battalion operation order nearly simultaneously with the BCT operation order via parallel planning, with a special focus on the three doctrinal warning orders. The third warning order should include the necessary details to begin movement, including the literal movement of engineer forces and barrier material. The BEB operation order, published shortly after the BCT operation order, includes coordinating instructions. This enables engineer company commanders and platoon leaders to actively contribute to the development of maneuver battalion operation orders rather than passively or reactively contributing to them.

Colocation and Planning Cycle

The brigade engineer and task force engineer tactical operations centers (TOCs) should be colocated with the BCT and the task force and integrated into the BCT and the task force planning cycles.

BEB Staff Reinforcement of Maneuver Brigade Engineer Staff

Think of the assistant brigade engineer as the tactical command post (TAC) and the BEB staff as the TOC. The BEB can, and should, reinforce the assistant brigade engineer during brigade planning efforts. This would also enable the simultaneous BCT and BEB operation order publication recommended above and is enabled by the colocation recommended above.

Habitual Relationships

Maneuver battalion and engineer unit habitual relationships are an effective means to facilitate and synchronize training within a garrison environment. However, habitual relationships are not a default combat task organization. Task force commanders must expect their engineers to be task-organized to other task forces, depending on the main effort, through the various phases of the operation. For example, engineers should be assigned or attached while in the offense but should be in direct support or general support while in the defense. Engineers are a scarce resource and should be massed at the critical point on the battlefield for greatest effect, which means that a maneuver battalion may not be allotted engineer support during an operation or during a phase of an operation. Habitual relationships must be established and maintained down to company team level. This means that engineer squad leaders should integrate into company team planning in garrison so that engineer formations can be more effectively used in the field and in combat. These TTP will help to promote mutual respect between maneuver leaders and engineers and increase understanding of engineer capabilities and limitations among maneuver leaders. They will also assist planning operations at the battalion task force level by enabling more educated and informed bottom-up feedback to task force plans. This will enable more synchronized/parallel planning efforts. It is important to remember that there will be different solutions for different BCTs because there will be three maneuver battalions supported by only two engineer companies with a total of three sapper platoons. As TTP for the task organization of engineers, I recommend that engineers not be task-organized below the platoon level for the deliberate breach of complex wire or mine obstacles.

Reserve

Due to the limited capabilities that the BEB provides to the BCT, engineers are never kept in reserve. This means that task forces and engineer formations must be adept at seamless and efficient task organization changes. However, these changes do not just happen. They are the byproduct of detailed planning and disciplined execution which must be foreseen and made in time so that the engineer company can be a part of the maneuver unit operation order and rehearsal process.

Focused Missions

Time is critical for engineers to shape the terrain, so they must be employed early and focused on missions that only they can perform. General missions, such as security, need to be performed by other formations. The key adage here is that people should not eat their seed corn.

Combined Arms Integration

Engineers should be integrated as a combined arms team for all operations, to include offensive, defensive, and stability operations. Surprisingly, this is a lesson that we had to relearn during Operations Iraqi Freedom and



A technical engineer conducts a site survey in southern Afghanistan. Joint Task Force Empire's mission was to provide synchronized combat and construction engineer effects through combined actions in support of joint operations.

Enduring Freedom. Experience has shown that when conducting route clearance, engineer units that operate independently have less effect and receive higher casualties than those that operate as part of a combined arms formation tied to a task force scheme of maneuver.

How to Articulate No Without Saying No

Task force engineers must know how to say no to maneuver leaders. The key thing is not to use the word *no*, since this leads to an immediate loss of credibility and respect. The proper way to say no is to describe the end result, point out the costs, enumerate the risks, and list the services the engineers will not be able to provide for the leader while they are executing the requested task. Then ask a question: Is this mission important enough in light of the end result, costs, risks, and tasks that will not be performed?

Reconnaissance/Counterreconnaissance Fight

Engineers must be integrated into the BCT reconnaissance and security fight to better inform the BCT military decisionmaking process and enhance maneuver and engineer effectiveness. The counter improvised explosive device fight in Iraq and Afghanistan can be thought of as the reconnaissance/counterreconnaissance battle in Operations Iraqi Freedom and Enduring Freedom. Success or failure in this battle is directly linked to success or failure in the main battle area.

Expanded Capabilities

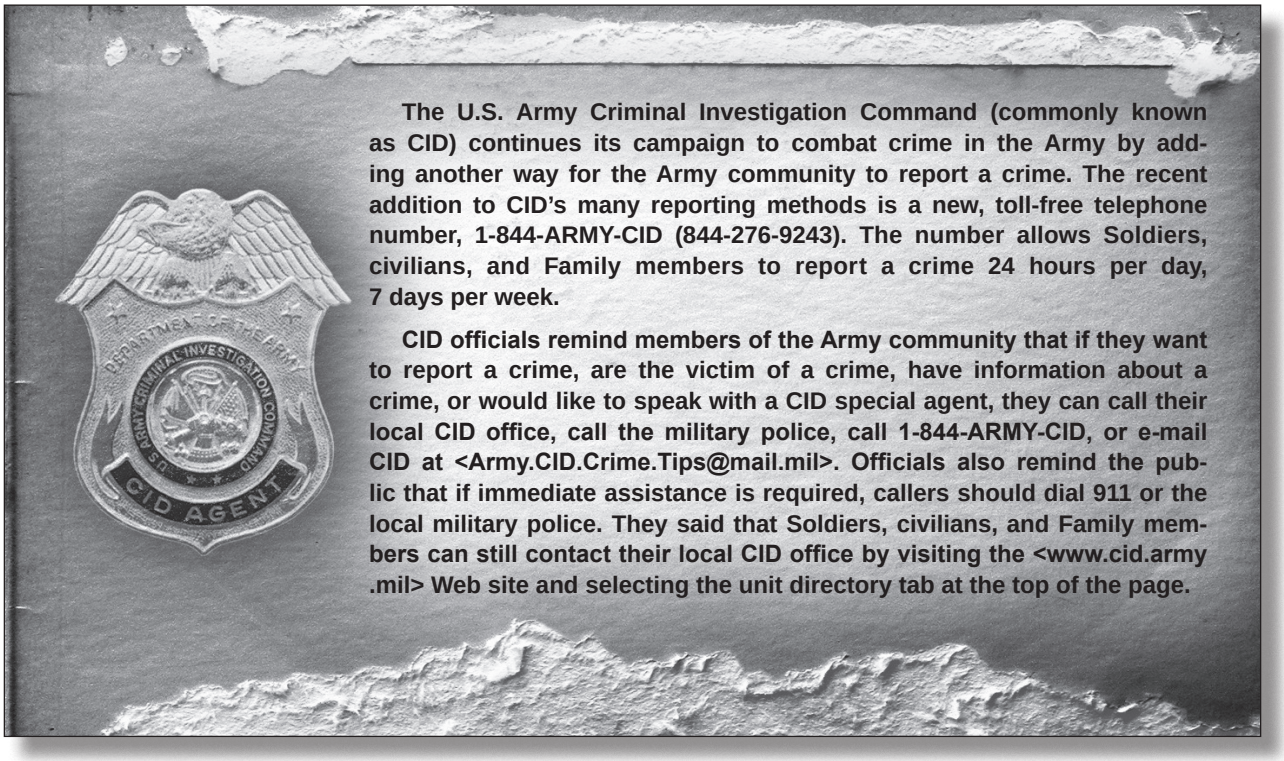
Engineers now have survey, design, and horizontal capabilities, which will expand the capabilities of the forces during expeditionary deployments. These capabilities need to be known and leveraged. In addition, every BCT will have a warrant officer construction engineering technician. These officers will provide a level of construction expertise and an operational energy advisor, which is new to BCTs.

In conclusion, more than 20 years of DOTMLPF history for the Army and the Engineer Regiment mean that the engineer battalion assigned to the BCT is a muscle that has not recently been exercised and may have skills that have atrophied. This also means that there is an experiential and generational gap that cannot be bridged by merely executing as we did in the 1990s. Maneuver and engineer leaders must understand what has changed along with what has not changed so that we can leverage old and proven TTP and critically and creatively develop new TTP for the effective use of the engineer staff and formations—those that are organic and those that are attached to the BCT.

Colonel Smallfield is the Director of Training and Leader Development at the U.S. Army Engineer School at Fort Leonard Wood, Missouri. He holds master's degrees from the Missouri University of Science and Technology, the U.S. Army Command and General Staff College, and the U.S. Army School of Advanced Military Studies. He is a project management professional, a certified facility manager, and a licensed private pilot.

Endnote:

[1]Jason L. Smallfield, "Employment of Brigade and Task Force Engineers: Part I," *Engineer*, Volume 44, May–August 2014, pp. 9–13.



The U.S. Army Criminal Investigation Command (commonly known as CID) continues its campaign to combat crime in the Army by adding another way for the Army community to report a crime. The recent addition to CID's many reporting methods is a new, toll-free telephone number, 1-844-ARMY-CID (844-276-9243). The number allows Soldiers, civilians, and Family members to report a crime 24 hours per day, 7 days per week.

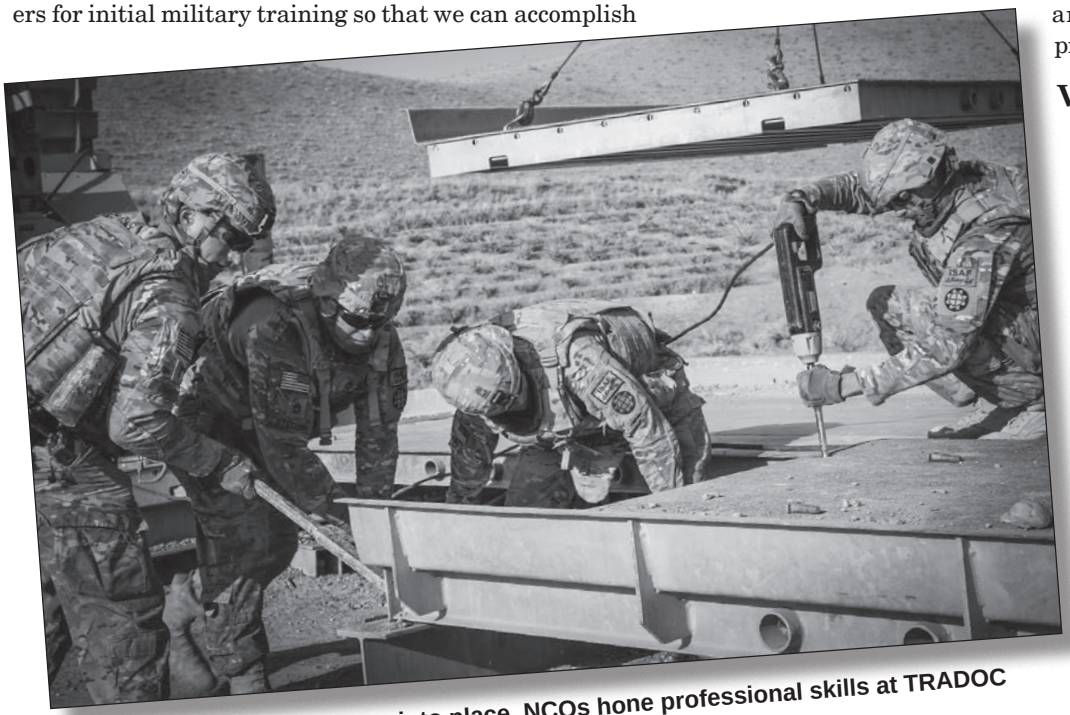
CID officials remind members of the Army community that if they want to report a crime, are the victim of a crime, have information about a crime, or would like to speak with a CID special agent, they can call their local CID office, call the military police, call 1-844-ARMY-CID, or e-mail CID at <Army.CID.Crime.Tips@mail.mil>. Officials also remind the public that if immediate assistance is required, callers should dial 911 or the local military police. They said that Soldiers, civilians, and Family members can still contact their local CID office by visiting the <www.cid.army.mil> Web site and selecting the unit directory tab at the top of the page.

SEND YOUR BEST TO TRADOC:

WE'LL SEND THEM BACK BETTER THAN WE GOT THEM

By Command Sergeant Major Ronald E. Johnson

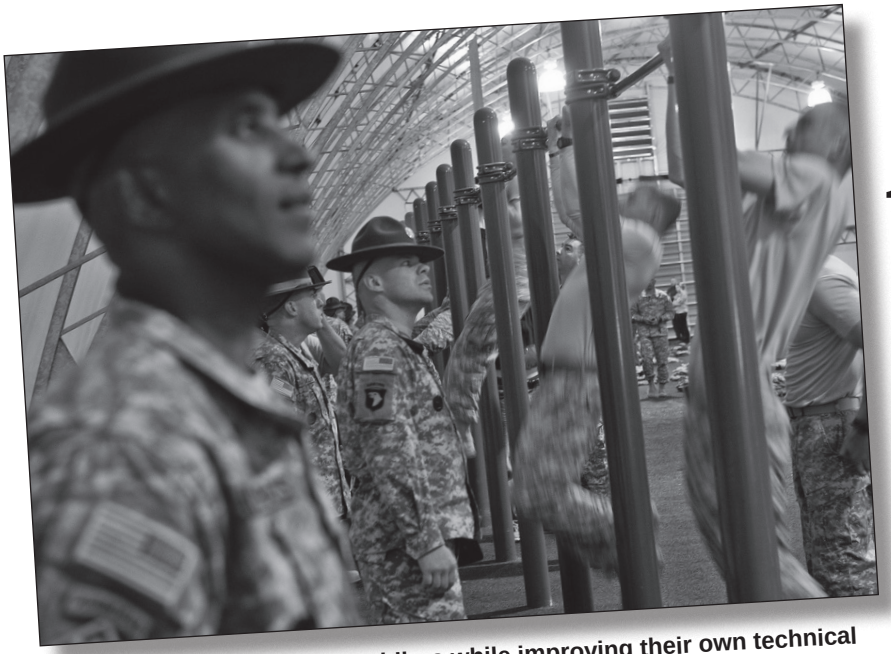
There has always been an incorrect belief that the U.S. Army Training and Doctrine Command (TRADOC) is a place to go rest for a couple of years. I've served as a drill sergeant, first sergeant and, now, as a command sergeant major in TRADOC units; and I can assure you that nothing is further from the truth. TRADOC is full of challenging leadership, training, and development opportunities every day. It is the Army's primary institutional domain for training and leader development; it will continue to play an even more important role as we transition from an Army of execution to an Army of preparation. Sending your best to serve in a TRADOC unit is important for two reasons. First, we need a constant stream of quality role models and trainers for initial military training so that we can accomplish our mission of providing the force with highly motivated, well-trained, and well-disciplined Soldiers. The old adage that you get out what you put in holds true. Second, the noncommissioned officers (NCOs) who serve in TRADOC units will broaden their leadership abilities and become better-trained tactical and technical experts with a wide range of leadership experiences. It is understood that we need the best NCOs to train the best Soldiers. An assignment in a TRADOC unit—specifically, in the 1st Engineer Brigade at Fort Leonard Wood, Missouri—will develop a well-rounded leader who is technically and tactically proficient. Completing a tour in a TRADOC unit and returning to the operational Army as a better leader will ensure that Soldiers are more competitive for promotion.



Engineers bolt a bridge piece into place. NCOs hone professional skills at TRADOC assignments.

Vast Knowledge and Capabilities

In the 1st Engineer Brigade, we like to say that the vast capabilities and knowledge of the entire Engineer Regiment start right here. We serve as the execution arm of the U.S. Army Engineer School, with the schoolhouse acting as the proponent for engineer training and doctrine for all Army components. Our mission statement is simple: We train and develop leaders and Soldiers (and Marines, Sailors, and Airmen) for operations to fight and win our



Drill sergeants create new Soldiers while improving their own technical and leadership skills.

Nation's wars. We train approximately 12,000 to 14,000 Soldiers, NCOs, warrant officers, and commissioned officers yearly on every engineer capability in the Army. From the most tactical military courses (such as combat engineering, combat engineer heavy track operations, and urban mobility breaching) to the most technical ones (such as geospatial engineer and technical engineer specialist), we train them all. And our NCO instructors are experts in the systems they teach.

We also train and develop leaders in the Sapper Leader Course, Engineer Officer Basic Course, and Engineer Captains Career Course. We train 14 military occupational specialty (MOS) courses, five additional skill identifier courses, and construction and geospatial technical warrant officer courses. Although we have no command responsibility for the Engineer Advanced Leader Course or Engineer Senior Leader Course, which are organized under the U.S. Army Maneuver Support Center of Excellence NCO Academy and the U.S. Army Sergeants Major Academy, we work with the academies to enhance training for our NCOs by sharing resources. We also work very closely with them to ensure that we are properly manned to accomplish our missions.

Future Leaders Need Broad Expertise

According to the Institute for NCO Professional Development, "The Army's NCO Corps must be up to the challenges of the geopolitical world envisioned in 2020. This will require leaders instilled with the capacity to effectively consider options, think effectively, and adapt strategies."[1] To me, this means that the NCO of the future needs to have a broad base of knowledge and experiences gained through a variety of assignments in the operational and generating realms. We are the institutional arm of training and leader development for the Engineer Regiment, but we also serve to broaden our NCOs in the operational domain.

An assignment to the 1st Engineer Brigade is a tremendous opportunity to broaden an NCO's experiences. We make a constant, deliberate effort to ensure that our NCOs move around to cross-train and enhance their expertise. For example, a horizontal construction engineer in the grade of staff sergeant may have served in a horizontal construction platoon for years and operated only one or two primary pieces of equipment. Here, that sergeant will train Soldiers on every piece of equipment in the MOS. After training Soldiers and mastering one particular piece of equipment, that trainer will move to a new phase to master another piece of equipment. After serving a 2-year tour here training our newest Soldiers in advanced individual training (AIT), an NCO instructor will return to the field as an expert on all equipment in the MOS.



Engineers learn demolition skills in AIT, and their platoon sergeants fare better in promotions than drill sergeants.

We also take every opportunity to send NCOs to schools. When I was a drill sergeant several years ago, the policy was that a serving drill sergeant trained Soldiers for 2 years and could not go to any professional development or functional courses. Now, we make every effort to invest in our NCOs by sending them to a variety of training opportunities. When NCOs come to your formations after an assignment here, they will be qualified at the appropriate level in the NCO Education System and accomplished in structured self-development. Because we are located at the home of the U.S. Army Engineer School, we can send our NCOs to a multitude of functional courses, including—

- Sapper Leader Course.
- Counter Explosive Hazards Center Route Reconnaissance and Clearance Course and Route Reconnaissance and Clearance Sapper Course.
- Joint Engineer Operations Course.
- Urban Mobility Breacher Course.

We engage in this effort to invest in the individual NCO and the future senior NCOs of the Regiment and to ensure that our NCOs are trained with a wide range of capabilities when they return to the operational force. We want you to know that from the day NCOs arrive at your units, you can give them any mission and they can be counted on to succeed.

In addition to cross-training and assignment to schools, we move NCOs to different positions to develop their knowledge and capability. We can accomplish this as the U.S. Army Human Resources Command moves toward longer tours between permanent changes of station. An AIT instructor who has spent 2 years teaching now understands what is correct in the program of instruction and what needs to be updated or changed. This instructor will make a great training developer in a directorate of training and leader development. As a training developer, the NCO gains a new perspective on how the institutional Army operates. In our relationship with the NCO Academy, we can also move NCOs through different leadership positions. Between assignments as drill sergeants, AIT platoon sergeants, instructors, and training developers, our ability to give NCOs a wide range of experience is virtually unlimited.



The TRADOC Joint Engineer Operations Course prepares Soldiers for work like this school restoration in Macedonia.



Training at the Counter Explosive Hazards Center prepares engineers to operate the latest equipment.

Leadership and Positions of Trust

Leaders across the Army have long recognized the leadership experience gained by serving as a drill sergeant. The hours are long, resources are closely managed, and the challenges are great as they transform civilian volunteers into the world's best-trained and most motivated Soldiers. However, it's not just drill sergeants who are gaining valuable leadership experience every day in TRADOC. The Army has designated several positions of trust, including drill sergeants, AIT platoon sergeants, sexual assault response coordinators, and recruiters. The 1st

Engineer Brigade has all of these except recruiters. These NCOs have already been screened for character violations in their past, and they possess the character we expect of our leaders. As the first impression of the NCO Corps and as role models for our newest Soldiers, our NCOs must be beyond reproach at all times. And they are! I've been the command sergeant major of the brigade for almost a year and have seen that our NCOs consistently outpace their peers in promotion rates. AIT platoon sergeants even fared better in promotions than drill sergeants.



TRADOC prepares Soldiers to confront the dangers of future wars, such as land mines.

Our instructors are in important positions as they train new Soldiers in their MOSs during AIT, instruct new lieutenants in the Engineer Officer Basic Course, or teach more experienced leaders in the Engineer Captains Career Course. As instructors, the duty description of NCOs is to lead students through the program of instruction to graduation. Our instructors are leaders who accomplish a lot with few resources. Whether trying to establish a tactical assembly area with 180 Soldiers who have been in the Army merely 6 weeks, counseling a new lieutenant who is struggling with course work while balancing challenging life issues, or dealing with any training situation in between, the leadership challenges are great and our NCOs solve these problems every day. The experience broadens their ability to solve problems and develop solutions that ensure mission accomplishment. When I finished my first assignment in TRADOC as a drill sergeant, I reported to the 555th Combat Engineer Brigade, where the leaders automatically had high expectations of me simply because they knew I had just come from a TRADOC unit. We want to ensure that you have the same high expectations of NCOs who have served here in the 1st Engineer Brigade.

We Need Your Best to Accomplish Our Mission

The NCOs of the 1st Engineer Brigade are highly competent, professional leaders who are the experts in our systems and tactics. The vision for the NCO of 2020 is a professional NCO who can think and solve problems to accomplish the mission in an uncertain environment. This requires a broad range of experiences. The future Army does not need one-trick ponies. I recently sat in on a session where one NCO asked, "I've got eight deployments. Shouldn't I have a better chance of promotion than others with fewer deployments?" The answer is, "No." We have raised a generation of NCOs with combat experience whose combat leadership is proven. I asked that NCO what he had done outside the traditional NCO leadership roles—team leader, squad leader, platoon sergeant, and first sergeant—to broaden himself and set himself apart from his peers. I used my own experiences as an example. I've been in all of the normal NCO leadership roles in the U.S. Army Forces Command (FORSCOM), but I've also been a drill sergeant; an equal opportunity NCO; an NCO in charge of a directorate of public works; a first sergeant in FORSCOM and TRADOC; and a command sergeant major in FORSCOM, the U.S. Army Installation Management Command, and TRADOC. The question I ask of junior NCOs is: With my experience, what can the Army ask of me that I can't handle?

An assignment in TRADOC—at any level of experience and grade—is a developmental opportunity. In the 1st Engineer Brigade, we strive to make the most of that opportunity. By encouraging NCOs to take advantage of the NCO Education System and functional training opportunities, to become experts that the Engineer Regiment can rely on, and to learn from unique, day-to-day leadership experiences, we guarantee that when you send your best NCOs to a TRADOC unit, we will send them back better, more competent, more creative, more agile, and more ready to serve in the most demanding leadership positions in your organization. No one stays in TRADOC forever. Encouraging your best NCOs to serve 2- to 3-year tours here is an investment in the future of the NCO Corps.

Command Sergeant Major Johnson is the command sergeant major of the 1st Engineer Brigade. He served one combat tour in Iraq with the 864th Engineer Battalion and two combat tours in Afghanistan with the 3d Brigade, 10th Mountain Division. He is a graduate of the U.S. Army Sergeants Major Academy and Excelsior College in Albany, New York.

Endnote:

[1]Aubrey G. Butts, Director of the Institute for NCO Professional Development, Fort Eustis, Virginia, "Mission Statement for NCO Development for the Army of 2020," briefing presented at Army Leader Development Forum 14-14, Fort Leavenworth, Kansas, 12 August 2014.



Solarium 2014

By Captain William R. Wren

On 11 July 2014, a group of U.S. Army captains met at Fort Leavenworth, Kansas, with Lieutenant General Robert B. Brown, commanding general of the U.S. Army Combined Arms Center at Fort Leavenworth; and Chief of Staff of the Army (CSA) General Raymond T. Odierno. As part of a CSA directive, the Combined Arms Center hosted the inaugural Solarium Conference to allow Army junior leaders to provide recommendations on strategic issues facing the Army in the near future. The history of Solarium dates back to 1953 when President Dwight D. Eisenhower held a conference with top U.S. officials to develop strategic foreign policies for the country following World War II. Based on President Eisenhower's idea, the Army is giving junior leaders the same opportunity following 12 years of conflict in the Middle East.

To fully understand the results of Solarium 2014, it is important to discuss the process used to arrive at the end state. This article outlines the process that the Solarium 2014 group used to identify current issues, develop recommended solutions, and describe the major outcomes of the conference.

Solarium 2014 was executed in four phases. Phase I identified 100 captains across all Army components and ended with the participants selecting the top three issues that they thought the Army would face in the future.

Phase II began with the Fort Leavenworth staff collecting input from the captains and grouping the issues into the following five categories:

- Talent management.
- Culture.
- Vision and branding.
- Education.
- Training.

This phase ended when all categories gained CSA approval and the participants divided into separate working groups.

In Phase III, each group researched its assigned category and held discussions via Defense Connect Online, milSuite, and teleconferences. The purpose of this phase was to acquire information about assigned topics before arriving at Fort Leavenworth on 9 July 2014. This phase ended when all groups had researched their topics and successfully narrowed their focus down to two or three issues.

Phase IV was the execution of Solarium 2014 at Fort Leavenworth, beginning on 9 July and ending with the CSA briefing on 11 July.

On 9 July, participants descended on Fort Leavenworth to finalize the topics to be presented to the CSA. The conference began with welcoming remarks by Lieutenant General Brown and an installation orientation by the Fort Leavenworth staff. Next, the groups moved to separate rooms to analyze the topics and finalize them for the final briefing. During this phase, each group worked with facilitators from the Red Team division at Fort Leavenworth, who helped the Solarium groups develop solutions in a condensed timeline. During the conference, the Red Team did not influence decisions, but introduced concepts on different techniques to work through complex problems. Their method was essentially to teach participants how to think.

They helped the teams avoid groupthink, approach problems sequentially, and develop effective recommendations for the CSA.

When the topics were developed, each group constructed two or three slides for the final briefing. By the end of the second day, the groups had finalized their topics and submitted slides to Red Team facilitators. The day concluded with a social event attended by Solarium participants, the brigade commanders and command sergeants major attending the precommand course, the CSA, and Sergeant Major of the Army Raymond F. Chandler.

On 11 July, Solarium 2014 participants briefed the CSA for 5 hours on their prepared topics. In attendance were the CSA; Lieutenant General Brown; Major General Thomas S. James, commander of the U.S. Army Mission Command Center of Excellence, Fort Leavenworth; and Command Sergeant Major Jeffrey W. Wright, the senior noncommissioned officer of the U.S. Army Combined Arms Center. One of the most interesting things about Solarium 2014 was that the CSA, who has almost every minute of his life scheduled with meetings and engagements, allocated 5 hours for junior leaders to brief him on strategic issues.

In a speech at the event, Mr. Ori Brafman, coauthor of the book "The Starfish and Spider," described how influencing and enacting change within an organization rests on four fundamentals:[1]

- Getting knowledge from the edge.
- Creating an environment that breeds innovation.
- Overcoming generational gaps.
- Forming and sustaining solutions.

The CSA firmly believes that the Army must abide by those principles to succeed in the future. The Army must enable a culture that allows junior leaders to develop innovative solutions to complex problems and provide a forum to express those ideas to senior leaders within the profession. During the entire briefing, General Odierno listened intently, took notes, and asked questions, never seeming distracted or disinterested. For 5 hours, participants had the undivided attention of the top officer in the U.S. Army. A typical military briefing features substantial numbers of slides in what is usually a conversation between the boss and the briefer. This was not the case in Solarium 2014. The atmosphere in the room was very relaxed, seeming more like a conversation than a briefing. The CSA constantly engaged the entire Solarium team for input, not just the selected few who were actually briefing him on the slides.

During the conference, the Solarium team made several recommendations to the CSA. The overarching theme was that the Army must begin a cultural shift from its current method of operating. It must resist becoming a risk-averse organization, enable leaders at the lowest level, develop agile units and Soldiers, and embrace technology without losing the human dimension. Some of these themes are reinforced in the article, "Texting No Substitute for Face Time," by David Vergun.[2] Due to the increasing reliance on technology, Army leaders too often rely on electronic communications instead of face-to-face conversations with Soldiers. This trend results in the perception of disengaged leadership and a failure to properly connect with and mentor subordinates. The CSA said that leaders are encountering this problem across the force at all ranks and age groups and that the importance of human interaction must be infused into current leadership.[3] He promised the group that he would provide feedback on the results of the conference, highlighting the fact that Solarium 2014 was a priority for the Army and demonstrating the trust that senior leaders in the Army have in their junior Soldiers.

"[The Army] must resist becoming a risk-averse organization, enable leaders at the lowest level, develop agile units and Soldiers, and embrace technology without losing the human dimension."

Solarium 2014 was the first of a series of conferences. The CSA directed that the event continue for years to come, each time focusing on different ranks, including commissioned officers, warrant officers, and noncommissioned officers. Solarium 2014 should inspire all junior leaders across the Army, demonstrating that senior leaders have an enormous amount of trust in us and welcome our innovative ideas and recommendations. The world is filled with chaos, and we are facing an unpredictable operating environment. Junior leaders will soon be responsible for leading the Army into the future.

Captain Wren is a small-group leader in the Engineer Captains Career Course at the U.S. Army Engineer School at Fort Leonard Wood, Missouri. He holds a bachelor's degree in criminal justice from Eastern Kentucky University and a master's degree in geological engineering from Missouri University of Science and Technology at Rolla. He is a graduate of the Sapper Leader Course, the U.S. Army Airborne School, and the U.S. Army Air Assault School.

Endnotes:

[1]Ori Brafman and Rod Beckstrom, *The Spider and the Starfish: The Unstoppable Power of Leaderless Organizations*, Portfolio Penguin, New York, 2008.

[2]David Vergun, "Texting No Substitute for Face Time, Captains Tell CSA," 14 July 2014, <http://www.army.mil/article/129901/Texting_no_substitute_for_face_time_captains_tell_CSA/?from=RSS>, accessed on 15 July 2014.

[3]Raymond T. Odierno, Army Chief of Staff, speech given at Solarium 2014, Fort Leavenworth, Kansas, 11 July 2014.



ENGINEERS SUPPORT U.S. BORDER PATROL

By Captain Ian S. Griffith and First Lieutenant Nathaniel D. Zimmerly

The Soldiers of 1st Platoon, 68th Engineer Company, 62d Engineer Battalion, Fort Hood, Texas, were tasked with completing several spans of road construction and making improvements to multiple low-water crossings to support Joint Task Force North and the U.S. Border Patrol in the Rio Grande Valley sector in Texas. This project increased freedom of movement for U.S. Border Patrol agents and enhanced their safety and ability to patrol the southern U.S. border. Before the platoon's deployment, the unit experienced months of training challenges, logistical hurdles, and coordination requirements among five government agencies. The platoon developed effective systems of construction project management and combined them with proven Army standard operating procedures to establish the foundation of the ultimate success of the project.

Although the scope of the project was not finalized at the time, the platoon leader first formulated an extensive list of requests for information, created an initial schedule based on the project drawings, and developed a training plan to prepare the Soldiers for the mission. The training plan evolved into three field training exercises (FTXs) that mimicked the standard crawl-walk-run model for Soldier skills training. Each FTX built on the level of training that was conducted at the preceding exercise and culminated in FTX III, a scenario-based event that included full-dress rehearsals of battle drills and several unexpected medical tasks to test the platoon casualty and medical evacuation procedures. The FTXs proved to be crucial and effective train-up tools and significantly reduced the learning curve when the platoon arrived on-site.

During project planning, the low-water crossing sites were the main priority. They were vital to the U.S. Border Patrol and gave agents freedom of movement to gain access to high-activity areas. The crossings became restricted for extended periods of time following heavy rain. To increase maneuverability at those locations, site designs employed sections of articulated concrete matting (ACM), which served as a drivable surface and an erosion control measure. This design presented a unique challenge since sections of the matting were not readily available for training. Platoon leaders contacted representatives from the ACM manufacturer, who provided classroom training on the installation and capabilities of the ACM system. This training vastly increased the overall quality of installation on the project sites.

As the unit approached deployment, the focus shifted from construction equipment familiarization and battle drill rehearsals to safety. The platoon received the after



Engineers use hand signals to position sections of ACM.

action reviews and lessons learned from previous construction missions supporting Joint Task Force North and quickly realized that the project had a high potential for accidents. As a result, platoon leaders developed and implemented stringent standards for safety and challenged the platoon Soldiers to earn the Joint Task Force North safety award, which is presented to units that complete projects with no construction safety-related accidents. Battalion leaders aided this effort by adding a mission commander to focus on the overall project and an officer in charge to focus on construction. The battalion also reinforced the platoon with Soldiers from the 63d Survey and Design Detachment to aid on-site quality assurance and quality control. Throughout the deployment, before the start of each training event and daily construction, the safety noncommissioned officer used online sites such as the Occupational Safety and Health Administration Toolbox Talks to develop briefings related to the equipment being used and environmental conditions present.[1] Each 15-minute briefing was part of the daily mission brief that addressed operator and leader checks, and the briefings fostered an atmosphere that placed safety first on the project site.

The platoon arrived at the project site in mid-May 2014 and quickly established systems and operating procedures with assistance from the departing unit. The first days of the project focused on medical drills, equipment familiarization, and briefings by site supervisors about construction plans. During the project, the platoon encountered civilian engineer equipment that was similar to equipment used at the



The platoon focused on reducing disturbances to the natural habitat while working to provide a high-speed mobility corridor for the U.S. Border Patrol.



Leaders huddle with a Joint Task Force North mission planner and an equipment trainer.

home station, but Soldiers required familiarization training and licensing before construction could begin. Civilian equipment experts assisted operators with familiarization training during the first week. The efforts and expertise of the civilian operators greatly reduced the learning curve and helped Soldiers gain confidence on the equipment before the start of construction.

The initial construction efforts were twofold: Soldiers at the first project site prepared to receive more than 300 linear feet of ACM as clearing and grubbing at the designated stations of road construction began at the second site. At both sites, the ACM required tolerances of less than 1/2 inch for the sections of mat to align properly. The global positioning system from the 63d Survey and Design Detachment served as a vital resource in verifying the elevation and slope of the road sections. Soldiers obtained the appropriate roadway width calculations to ensure continuity between each mat section. In addition to validating the slopes, elevations, and roadway edges, construction efforts focused on achieving U.S. Army Corps of Engineers compaction specifications. The specifications required the appropriate amount of water content for each soil type, which was attained by using a 12,000-gallon, quick-fill water tower that reduced fill times by almost 90 percent.



A Soldier uses a grader on a section of all-weather road.

The matting installation proved to be the least challenging activity of the project. With expert advice from the on-site manufacturer's representative, installation was completed in less than 2 days. Progress at the road construction sites continued as scheduled until the team got closer to the border at the Rio Grande River. Proctor compaction tests determined that the soil in these areas had a relatively high density and would prove difficult or impossible to compact. As clearing

and grubbing operations commenced, operators unearthed soil conditions that confirmed these challenges. Since the soil would not meet design specifications, it would need to be excavated and backfilled with suitable material. The team developed plans to address the massive amounts of material it would need to replace. Since the bill of materials contracted for the project had already been expanded to cover an existing shortage in material, the placement of the unsatisfactory soil would need to be achieved through other means.



An excavator removes unsuitable material near the Rio Grande River.

Our team located suitable material farther away from the Rio Grande River, where it could be quickly harvested and replaced with the unsuitable material that had to be removed from the jobsite. After receiving approval, operators excavated and replaced more than 6,000 tons of material. Site supervisors minimized the wastage of material to increase efficiency. These techniques were developed and incorporated from lessons learned during earlier portions of the project and enabled the site supervisors and operators to overcome the obstacles encountered during the final weeks.

The experience gained and lessons learned from the project were invaluable to the development of all levels of leadership and will contribute to the success of future company operations. The platoon leaders and site supervisors sharpened their project management skills and discovered effective methods of mission command. Noncommissioned officers skillfully developed systems to streamline material management and overall construction logistics and instituted procedures to verify completed construction work. Soldiers logged thousands of hours of operating time on multiple pieces of engineer equipment. Despite the logistical challenges and setbacks caused by material shortages and unforeseen obstacles, the platoon embraced the real-world impact of their efforts and demonstrated resilience by completing the full scope of work.

This mission was extremely valuable training to the 68th Engineer Company and 62d Engineer Battalion. The battalion gained experience in deploying a construction element on a high-profile construction mission. Company leaders gained valuable experience in construction management and road building, which are two vital tasks from the mission-essential task list. The keys to mission success were the decision to augment the platoon to enhance mission command and the planning conducted at the company level. The decision was made to assign the company commander to the mission and add surveyors to help with quality assurance and quality control. The addition of the company commander allowed the platoon leaders to focus on construction operations while the commander handled logistics and coordinated stakeholders. The 68th Engineer Company developed a sound training strategy that involved progressively more complex training events. The leaders researched ACM construction and reached out to the manufacturer for additional training. The company also rehearsed the deployment, onsite preparation, and actual construction. During construction, the company conducted daily hot washes that allowed the company to learn and grow. The company incorporated lessons learned and improved throughout the project. As a result, the platoon completed the project on time and to standard with no construction safety-related accidents.

Mission success would not have been possible without the mentorship of Joint Task Force North mission planners, who provided tremendous logistics support and project oversight.

Captain Griffith is the commander of the 68th Engineer Company, Fort Hood, Texas. He holds a bachelor's degree in management and engineering administration from Park University and a master's degree in engineer management from Missouri University of Science and Technology at Rolla.

First Lieutenant Zimmerly is a platoon leader for the 68th Engineer Company. He holds a bachelor's degree in construction management from Bradley University.

Endnote:

[1]OSHA Training.com, "Free Toolbox Talks," <http://www.oshatraining.com/Toolbox-Talks.php>, accessed on 13 August 2014.

ENGINEER DOCTRINE UPDATE

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

Publication Number	Title	Date	Description (and Current Status)
Publication Revisions			
ATP 3-34.22 (FM 3-34.22)	*Engineer Operations—Brigade Combat Team and Below*	Feb 09	This is a revision and conversion of Field Manual (FM) 3-34.22, *Engineer Operations—Brigade Combat Team and Below*, to Army Techniques Publication (ATP) 3-34.22. It is under development and will include information on the brigade engineer battalion (BEB). **Status:** Staffing of the final draft is complete, and the final approved draft is being prepared.
ATP 3-34.23 (ATTP 3-34.23)	*Engineer Operations—Echelons Above Brigade Combat Team*	Jul 10	This is a revision and conversion from Army Tactics, Techniques, and Procedures (ATTP) 3-34.23, *Engineer Operations—Echelons Above Brigade Combat Team*, to ATP 3-34.23. **Status**: Staffing of the final draft is complete, and the final approved draft is being prepared.
ATP 3-90.61 (FM 3-90.61)	*Brigade Special Troops Battalion*	Dec 06	This is a revision and conversion from FM 3-90.61, *The Brigade Special Troops Battalion*, to ATP 3-90.61. **Status:** The final draft was sent for worldwide staffing in September 2014. To be published 3d quarter, FY 15.
Combat Engineering			
ATP 3-34.20 (FM 3-34.210)	*Explosive Hazard Operations*	Mar 07	This is a multi-Service manual and conversion from FM 3-34.210, *Explosive Hazards Operations,* to ATP 3-34.20. **Status:** Staffing of the final draft is complete, and the final approved draft is being prepared. To be published 1st quarter, FY 15.
ATP 3-90.4 (ATTP 3-90.4)	*Combined Arms Mobility Operations*	Aug 11	This is a multi-Service manual and conversion from ATTP 3-90.4, *Combined Arms Mobility Operations*, to ATP 3-90.4. **Status:** Staffing of the final draft is complete, and the final approved draft is being prepared.
ATP 3-90.8 (FM 3-90) (FM 5-102) (FM 90-7)	*Combined Arms Countermobility Operations*	Sep 14	This multi-Service manual is a full revision that consolidates FM 3-90, *Tactics*; FM 5-102, *Countermobility*; and FM 90-7, *Combined Arms Obstacle Integration*. It 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:** Current.
ATP 3-90.37 (FM 3-90.119)	*Combined Arms Improvised Explosive Device Operations*	Jul 14	This is a conversion from FM 3-90.119, *Combined Arms Improvised Explosive Device Defeat Operations*, to ATP 3-90.37. **Status:** Current.

"Doctrine is indispensable to an army. Doctrine provides a military organization with a common philosophy, a common language, a common purpose, and a unity of effort."

General George H. Decker,
U.S. Army Chief of Staff, 1960–1962

Engineer Doctrine Update

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

Publication Number	Title	Date	Description (and Current Status)
General Engineering			
ATP 3-34.5 (FM 3-100.4)	*Environmental Considerations*	Feb 10	This is a conversion from FM 3-100.4, *Environmental Considerations in Military Operations*, to ATP 3-34.5. **Status:** Staffing of the final draft is complete, and the final approved draft is being prepared. To be published 1st quarter, FY 15.
ATP 3-34.40 (FM 3-34.400)	*General Engineering*	Dec 08	This multi-Service manual is a conversion from FM 3-34.400, *General Engineering*, to ATP 3-34.40. **Status:** Staffing of the final draft is complete, and the final approved draft is being prepared. To be published 1st quarter, FY 15.
ATP 3-34.81 (FM 3-34.170)	*Engineer Reconnaissance*	Mar 08	This is a conversion from FM 3-34.170, *Engineer Reconnaissance*, to ATP 3-34.81. **Status:** The final draft was sent for worldwide staffing in September 2014. To be published 3d quarter, FY 15.
Geospatial Engineering			
ATP 3-34.80 (FM 3-34.230)	*Geospatial Engineering*	Jun 14	This is a conversion from FM 3-34.230, *Topographic Operations*, to ATP 3-34.80. **Status:** Current.

Notes:

1. Current engineer publications can be downloaded from the Army Publishing Directorate Web site at <http://www.apd.army.mil>. The manuals discussed in this article are currently under development and/or recently published. Drafts may be obtained during the staffing process by contacting the Engineer Doctrine Branch at commercial (573) 563-0003, DSN 676-0003, or <usarmy.leonardwood.mscoe.mbx.cdidcodddengdoc@mail.mil>. The development status of these manuals was current as of 22 September 2014.

2. Items in parentheses are publication numbers of current publications, which will be (or have been recently) superseded by the new number at the top of the entry. Multiple numbers in parentheses indicate consolidation into one manual.

3. Currently, all 30 Army doctrine publications/Army doctrine reference publications have been published. Every Army professional should have a basic knowledge of our fundamental principles since they rarely change quickly. They can be downloaded from the Army Publishing Directorate Web site at <http://www.apd.army.mil>.



ENGINEER DIVE SUPPORT TO U.S. ARMY WATERCRAFT



By Captain Steven R. Pingree and First Lieutenant Zachary C. Chrismon

There is a small group of Soldiers within the Engineer Branch who are united by a proud, aquatic tradition. They face the most inhospitable environments, armed only with the air that they carry on their back or that is fed to them through a diving umbilical. Regardless of the diving mode, there is no way to predict which hazards of the deep await a person who insolently plunges into the world's cold, muddy waters. The conditions are so harsh that even precious, life-sustaining air may not be a consistent ally. The crushing depths drive the gas deep into the diver's tissues, where increased partial pressures of nitrogen play tricks on the mind through a narcotic effect known as the "rapture of the deep." For divers who avoid the siren song of this nitrogen narcosis, the dissolved gases patiently wait to wreak havoc on the careless person who ascends without paying the proper tribute of decompression time. Those who come to the surface too quickly will be greeted by numbness, paralysis, or death. Humans were not meant for these depths. Still, since 1943, a select group of men and women have flouted nature by donning a diver's dress and accomplishing their mission without regard to the inherent dangers of their task. They are U.S. Army engineer divers.

In World War II, engineer divers repaired damaged ports to maintain freedom of maneuver for the vessels transporting U.S. troops and equipment. Sixteen Soldiers were assigned to each of the 11 engineer port and construction repair groups that served during that time. Over the decades, the engineer dive field has expanded to include the following capabilities relevant to mobility and countermobility:

- Port opening, construction, and rehabilitation.
- Salvage.
- Search and recovery.
- Force protection.
- Ship's husbandry.
- Joint logistics over-the-shore.

Today, the Soldiers of the 511th Engineer Dive Detachment carry on the legacy of the original Army engineer divers by supporting Army watercraft throughout the U.S. Army Central area of responsibility. Tucked away on Sheikh Muhammad Naser al-Ahmad Naval Base in Kuwait, whose piers still bear the scars of Iraq's 1990 invasion, the

detachment provides a variety of capabilities to military units operating in the region. Ranging from technologically sophisticated reconnaissance techniques using side-scan sonar and hydrographic survey equipment to relatively crude methods of cleaning vessels with hand tools, the 511th Engineer Dive Detachment is always ready to support missions below the waterline. In January 2014, the detachment was assigned to support Operation Enduring Freedom and it has been working across the spectrum of engineer diving in support of Army watercraft.

The basic requirements to safely unload ships have changed very little from the days of World War II. Clear channels and berthing sites are essential to ensure that vessels can reach their destination and discharge their equipment. Before a vessel can enter a new port, the depths of the approach channels and harbor must be confirmed. This data is generated by the Army engineer diver hydrographic survey system and provided to vessel masters to judge whether the depth of a port is sufficient to enter. The 511th Engineers conducted one survey in June 2014 to verify the feasibility of using a Kuwait coast guard station for future Army watercraft use. A team traveled to the site to collect the data for future reference. In addition to collecting several hundred depth readings, the team collected the critical dimensions of the port facilities to determine their capacity to accept large Army vessels. After collecting the data, the team summarized its findings and presented them to the Army watercraft unit to determine the port's feasibility. The specialized knowledge and technical skill gathered by the team provided U.S. Army Central with critical information for future operations.

Once ports have been deemed usable, they are inspected before the arrival of each vessel to ensure that the conditions are adequate for berthing. To date, the divers have performed nine port and vessel clearance missions across the Persian Gulf region to facilitate U.S. Army watercraft deliveries. On these missions, teams of scuba divers traveled ahead of the vessels to inspect port facilities and potential berthing sites. These inspections ensured that all port structures were free of possible hazards that could damage the hulls of vessels. The divers also provided hasty structural assessments of the ports to verify their condition and capacity to withstand the loads associated with the deliveries. Once the inspections were complete and the ships had moored in their berthing sites, the scuba teams inspected hulls to identify and remove any debris that became entangled during travel. During the hull inspections, the divers swam from bow to stern, searching for signs of damage.

". . . there is no way to predict which hazards of the deep await a person who insolently plunges into the world's cold, muddy waters."



Army divers from the 511th Engineer Dive Detachment work to successfully salvage an anchor that had been entangled on the sea floor.

They reported their findings to the diving supervisor who instructed them on corrective actions, based on the conditions. These port and vessel clearance missions ruled out the possibility of objects that could damage berthing vessels and provided a valuable service by removing debris and increasing Army watercraft efficiency and performance.

The detachment has also conducted ship's husbandry tasks for the vessels located at the Kuwaiti naval base. These missions include inspecting hulls, and cleaning, patching, and changing propellers. Without dive support, these operations would require that vessels be dry-docked, which involves significant time and expense. Organic marine growth is a constant problem for locally stationed vessels. Barnacles infest the propellers and cooling systems of the watercraft, significantly decreasing their ability to perform. By continuously working on these boats to provide routine service, the 511th Engineers have saved the U.S. Army Materiel Command more than $25,000 in work that would have been paid to civilians with similar capabilities. These cost savings and increased readiness are testaments to the relevance and effectiveness that engineer dive teams have provided the Army for decades.

While performing missions across the Middle East, the 511th Engineer divers also train to maintain proficiency in mission-essential tasks for large-scale salvage and clearance operations. In May 2014, the detachment partnered with local Kuwaiti divers to locate and dispose of a large, concrete obstruction at Sheikh Muhammad Naser al-Ahmad Naval Base. The mission tested the ability of both teams to perform underwater reconnaissance, use salvage pontoons for lifting, remove the obstacle, and use rigging procedures to relocate it to a safer location. The partnership exercise was a great success that demonstrated the ability of the divers to provide large-scale port opening services if the need arises.

For more than 60 years, Army engineer divers have been recognized for their specialized skill set, ingenuity, and dedication to mission accomplishment. As described by the narrator of the Army's television show *The Big Picture: Army Divers' School* more than 50 years ago, "To become a diver, a man must have some remarkable mental and physical qualifications. A diver is alone underwater. Against the dangers he meets, he has only his diver's gear, his technical knowledge, and his common sense to help him. Army divers are relatively few in number, but they're a proud service; and they have a right to be proud."[1]

Captain Pingree is the commander of the 511th Engineer Dive Detachment. He holds a bachelor's degree in civil engineering from the U.S. Military Academy and a master's degree in civil engineering from Missouri University of Science and Technology at Rolla. He is a licensed professional civil engineer in Missouri.

First Lieutenant Chrismon is the executive officer of the 511th Engineer Dive Detachment. He is a graduate of the University of North Carolina at Chapel Hill.

Endnote:

[1]*The Big Picture: Army Divers' School*, U.S. Army, <http://www.youtube.com/watch?v=a6iytODI16k, accessed on 28 July 2014.

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Technical Manual 3-34.83, *Engineer Diving Operations*, 2 August 2013.

William White, "Army Divers Survey Kuwait Coast Guard Base," *Defense Video and Imagery Distribution System*, 23 June 2014, <http://www.dvidshub.net/news/134061/army-divers-survey-kuwait-coast-guard-base>, accessed on 22 July 2014.

("Lead the Way," continued from page 4)

We still need more combat engineers (military occupational specialty 12B) in the grades of sergeant through sergeant first class to attend the Sapper Leader Course. Despite the low input of NCOs, I want to acknowledge Sergeant Joshua J. Clark, 21st Engineer Battalion, who was the distinguished honor graduate for Sapper Leader Course Class 07-14. He earned 938 out of a possible 1,000 points. I know our Regiment has more stellar NCOs in our formations, and we must get them to the course.

Also in June, we listened to Chief of Staff of the Army General Raymond T. Odierno, Sergeant Major of the Army Raymond F. Chandler III, the Army staff, and other superb leaders during the Army Training and Leader Development Conference at Alexandria, Virginia. I want to paraphrase a message from the Chief of Staff about our Army: Even as we downsize our Army, we will remain the Service of choice; and as strategic leaders, we must keep challenging ourselves and the subordinates we lead. Now is not the time to become stagnant because we must keep moving forward and adapting to change as agile leaders thinking critically and creatively. Never forget to stay ready because we have never failed the Nation's call during the past 239 years. *Essayons!*

Endnotes:

[1]Engineer School Knowledge Network, <https://www.us.army.mil/suite/page/637460>, accessed on 18 August 2014.

[2]Alyssa Bane and Matt Fender, "Normandy American Cemetery–June 5th, 2014," Patriotic Education Travel Program, 6 June 2014, <http://cofonormandy2014.wordpress.com/2014/06/06/normandy-american-cemetery-june-5th-2014/>, accessed on 11 August 2014.

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Field Manual 3-34, *Engineer Operations*, 2 April 2014.

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Articles should be concise, straightforward, and in the active voice. Avoid using acronyms when possible. When used, acronyms must be spelled out and identified at the first use. Avoid the use of bureaucratic jargon and military buzzwords. Text length should not exceed 2,000 words (about eight double-spaced pages).

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Army Engineers at the Battle of the Bulge

By Mr. Gustav J. Person

Although the D-Day invasion of Normandy on 6 June 1944 gave the Allies a beachhead in northern France, it took almost 2 months of bitter fighting to break out of the Normandy hedgerows. After the breakout, Allied armies raced across France, liberated Paris, and drove toward the German frontier. The rapid pace of the advance exerted a severe strain on Allied logistics, which along with bad weather and stiffening German resistance, slowed the offensive. By mid-December, American armies had reached the Roer River inside Germany and the West Wall (Siegfried Line) in eastern France. Between these two fronts lay the Ardennes, a hilly, densely forested area through which the Germans had projected their offensives in 1870, 1914 and, particularly, in May 1940. The 1944, German offensive there soon earned the title of the Battle of the Bulge.[1]

Cloaked in thick forests, the Schnee Eifel region in the lower Ardennes was well adapted to concealment. Small villages that were capable of harboring large forces offered excellent dispersal. Camouflage had become second nature with German soldiers in the west; indeed, since the invasion, the art of camouflage had become the science of survival.[2]

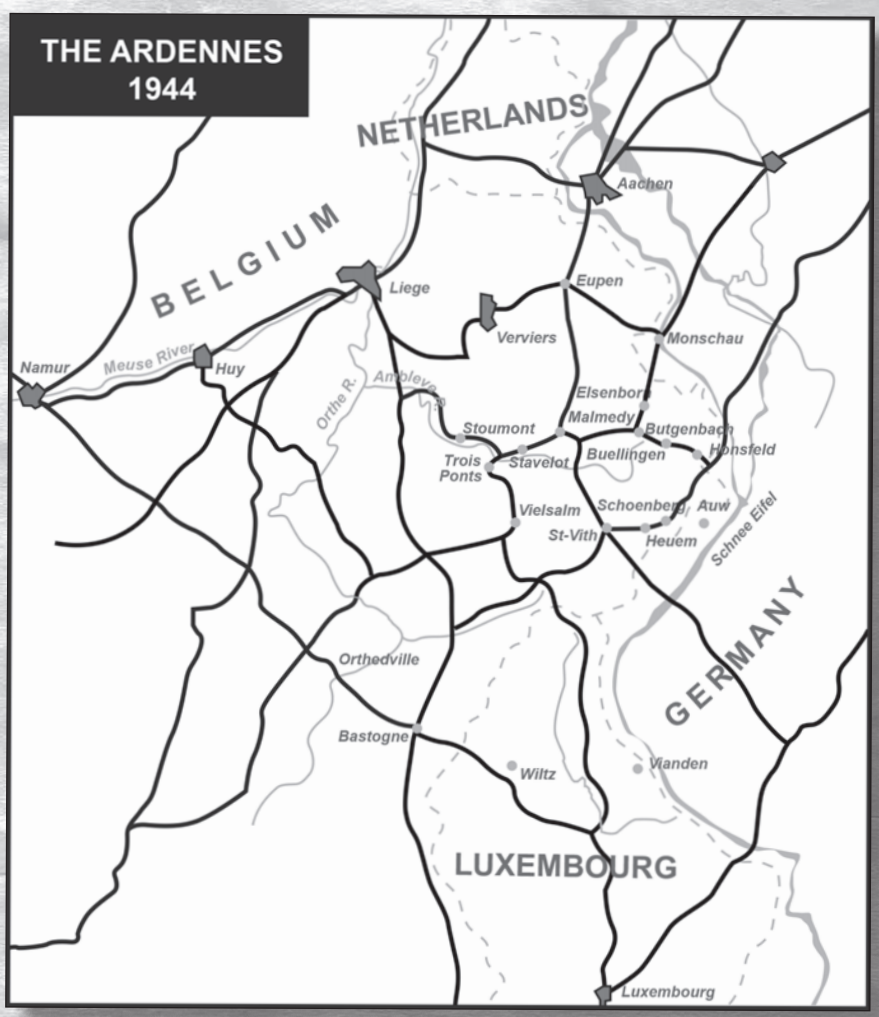
Adolf Hitler's selection of the Ardennes as the sector to launch his western counteroffensive was based on the obvious advantage of attacking the Allies where they were weakest. Even so, although the Allies could not be strong everywhere along the line from Switzerland to the North Sea, they did outnumber the Germans in men, tanks, guns, and aircraft. They could also rapidly move large forces; and the Allies, not the Germans, had the strategic initiative.[3]



U.S. Army photo

Army engineers move out from the defensive positions they defended all night in Luxembourg.

Five American divisions and a cavalry group of the First U.S. Army, commanded by Lieutenant General Courtney Hodges, held the 85-mile Ardennes front. The difficult terrain and the belief that the German army was near exhaustion had convinced Allied commanders that the Ardennes sector was relatively safe. Thus, three of the divisions were new, full of green Soldiers who had only recently arrived in Europe; the other two were recuperating from heavy losses suffered in the Huertgen Forest. These two divisions, the 4th Infantry and 28th Infantry of U.S. Army Corps commander Lieutenant General Troy H. Middleton, formed the right flank of the First Army.[4] These veteran units were responsible for training and conditioning the replacements for some 9,000 battle casualties from the recent battles in France. Additionally, the growing shortage of American troops had forced Allied planners to man portions of the front very lightly.[5]

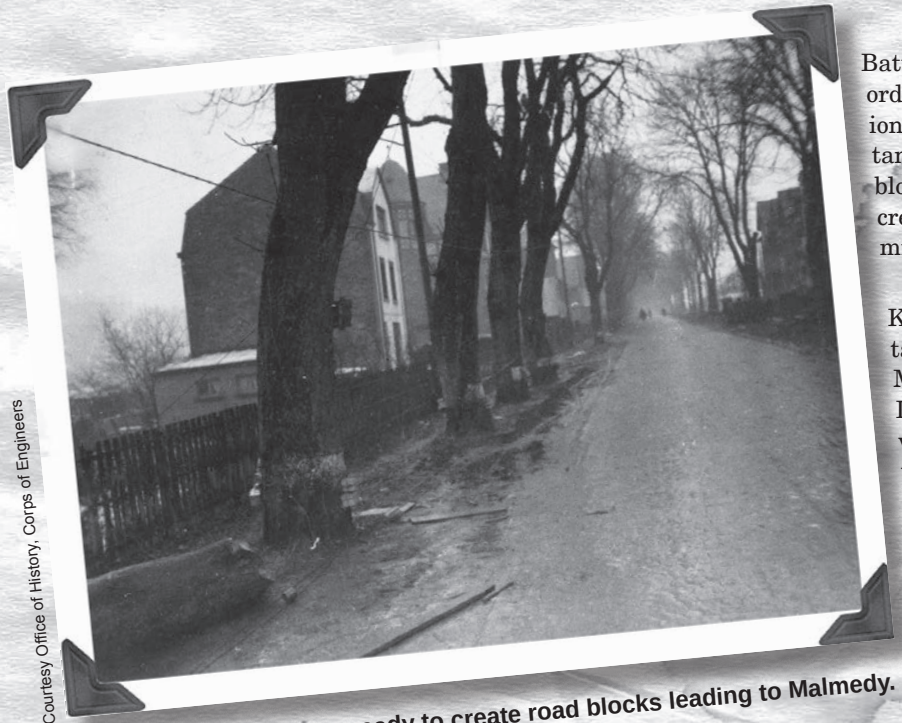


Map courtesy of Mark Jeffries

After weeks of retreat, Hitler planned a bold offensive to regain the initiative in the west. Under cover of the snowy winter weather, Hitler massed some 25 divisions in three armies opposite the Ardennes and planned to drive through the American front, cross the Meuse River, and capture Antwerp. If the offensive succeeded, it would split the British and American army groups and, Hitler hoped, force the British out of the war. The front had been quiet for 2 months before the offensive was launched just before daybreak on 16 December, surprising the American forces in the Ardennes following a major intelligence failure.[6]

As the American frontline units collapsed and began to retreat, divisional and nondivisional engineer battalions were called up to stem the tide while reserves mobilized and rushed to the scene. Many of the corps and army engineer battalions scattered throughout the area in company-, platoon-, and even squad-size groups were thrown into action. Engineers who had been engaged in road maintenance, sawmill operations, and the construction of winter quarters suddenly found themselves manning roadblocks and preparing defensive positions in the face of powerful German armored columns. Snaking their way through the narrow Ardennes roads, the Germans were bent on reaching the Meuse River without delay. Many of the engineer combat battalions and other engineer units would play important roles in the Bulge, in many cases by operating as infantry.[7]

By the evening of 16 December, it was clear that the German attack was an offensive on a grand scale from Monschau in the north to the Luxembourg border. In the Schnee Eifel, the Germans committed the entire LXVI Corps of General Hasso von Manteuffel's Fifth Panzer Army. Lieutenant Colonel Thomas Riggs, commanding the 81st Combat Engineer Battalion, received orders to commit his engineers as infantry, with their respective regimental combat teams, as the Germans mounted a pincer attack around St. Vith, Belgium. The 81st was rounded out with elements of the 168th Engineer Combat Battalion, and together they dug in on a wooded ridge about a mile east of the town of Schoenberg. The Germans attacked with three self-propelled 88-millimeter assault guns, but the defending Americans delayed the enemy until dusk, when tanks of the U.S. 7th Armored Division arrived from St. Vith. The engineers stopped some of the German tanks by pulling a chain of mines across the road. The following day, a group under Lieutenant Colonel Riggs counterattacked, driving some German infantrymen out of hillside positions. During the next 2 days, the engineers laid hasty minefields along possible enemy avenues of approach and covered their foxholes with logs for protection from tree bursts. Patrols went into St. Vith to salvage anything useful—food, blankets, and clothing. By 21 December, German successes around Bastogne had isolated the St. Vith forces from the rest of VIII Corps. The enemy directed a concentrated barrage of artillery, rocket, and mortar fire on the tankers and engineers,



Courtesy Office of History, Corps of Engineers

Demollition charges are ready to create road blocks leading to Malmedy.

inflicting heavy casualties. Company A, 81st Engineer Combat Battalion, lost 40 of its 65 men. Company C of the 81st, with the 424th U.S. Infantry south of St. Vith, protected the approaches to the town by guarding and blowing bridges. That afternoon, a heavy German assault led by tanks and accompanied by intense artillery, rocket, and mortar fire, overran the exhausted American defenders. Lieutenant Colonel Riggs ordered his men to break up into small groups and attempt to escape to the rear. The Germans captured most of the survivors, including Riggs.[8] For its very first combat engagement, the 81st Engineer Combat Battalion received the Distinguished Unit Citation.[9]

On the night of 16 December, a heavy concentration of enemy artillery fire shook the eastern and southern flanks of V Corps 99th Infantry Division. Under cover of this barrage, tanks of the Sixth Panzer Army advanced west toward the Meuse River, creating a major threat in the northern Ardennes. Around midnight, a message came to the U.S. V Corps 254th Engineer Combat Battalion, which was repairing roads in support of the 2d and 99th Infantry Divisions. The engineers were on a 2-hour alert to act as infantry. Engineer Companies A, B, and C were to form a defensive line south and east of Buellingen to protect the American tanks and tank destroyers withdrawing under pressure from Germans coming from Honsfeld. Under a heavy attack, the 254th position became hopeless. The Soldiers were ordered to fall back while fighting a delaying action through Buellingen. The tanks that came up the Honsfeld road early on 17 December belonged to *Kampfgruppe* "Battle Group" *Peiper*, the armored spearhead of I SS Panzer Corps, the strongest fighting unit of Sixth Panzer Army, under *Obersturmbannführer* "Lieutenant Colonel" Joachim Peiper. Buellingen was an important supply area, with dumps and numerous service troops. The 2d Engineer Combat Battalion, part of the 2d Infantry Division, was ordered to hold the town at all costs. The battalion put up a determined defense until Peiper's tanks arrived. The 2d had worked heroically to block the road to the east by felling trees and creating abatis, which were supplemented by mines and booby traps.[10]

After overcoming defenses at Buellingen, Krinkelt, and the Elsenborn Ridge, Peiper's tanks swung west toward their objective, a Meuse crossing at Huy, about 15 miles from Liege. Peiper was already deep into the area where U.S. service troops of First Army were working behind the combat zone. The first news of the enemy breakthrough came to the 1111th Engineer Combat Group commander, Colonel H. W. Anderson, on 17 December. This posed a serious threat to Malmedy, 5 miles northeast of Stavelot. At Malmedy, Anderson had about 200 men of the 291st Engineer Combat Battalion, aided by the 962d Engineer Maintenance Company, which was building a landing strip near First Army headquarters at Spa. Anderson ordered the engineers to prepare to defend the town, but the movement of American armor units toward St. Vith caused a panic, resulting in the hurried departure of most of the First Army rear units. The engineers were left with mines and a few bazookas.[11]

By noon, the engineers had set up roadblocks on the edge of town. In an incident of friendly fire, Sergeant Christian Schweitzer, a demolitions specialist and bridge carpenter in the 291st, remembered being struck twice by bombers of the U.S. 9th Air Force, which dropped 500-pound bombs on their worksites. Later, they were approached by four survivors of the "Malmedy massacre," in which Peiper's men murdered at least 86 captured American Soldiers. Schweitzer and his comrades retrieved the bodies of the victims and rescued about 15 survivors of the massacre.[12]

By the time Peiper turned his lead tanks toward the town of Trois Ponts, the 1111th Engineer Combat Group had prepared the three nearby bridges over the Ambleve and Salm Rivers for demolition. The 51st and elements of the 291st Engineer Combat Battalions prepared to defend the town. They were armed with only machine guns, bazookas, and one 57-millimeter antitank gun. Stymied at the bridges, Peiper turned his tanks north, probing for a way to outflank the town, but also sent infantry and additional tanks to capture this strongpoint. Major Robert B. Yates, the 51st executive officer, drew his men into the center of the town, where he employed several ruses to hide his weakness in men and weapons. The engineers held out for 5 days until they were relieved by a party of paratroopers from the 505th Parachute Infantry Regiment of the 82d Airborne Division. When the paratroopers arrived, Major Yates greeted their commander with, "Say, I'll bet you fellows are glad we're here!" The engineers were exhausted and numb from the bitter cold, which averaged 20°F. The award of a Distinguished Unit Citation

". . .at crucial points on the front, divisional engineers were the only troops on the scene when the Germans struck. The engineers were able to upset the German timetable, delaying the onrushing columns long enough for American reinforcements to be brought to the five main areas of resistance throughout the Ardennes."

to the 51st Engineer Combat Battalion was well deserved. Meanwhile, combined elements of the 82d Airborne, 30th Infantry, and 3d Armored Divisions stopped Peiper on the Ambleve River near Stoumont.[13]

Other engineer units were fighting delaying actions in other parts of the Bulge. Farther south, the 44th Engineer Combat Battalion tried to defend the town of Wiltz, southeast of Bastogne, but the Germans forced them back, inflicting heavy casualties. The battalion suffered heavily during its withdrawal through German roadblocks and a gauntlet of fire. The 44th was opposed by tanks and assault guns of an elite German unit. Before the attack, the 44th had been engaged in road maintenance, operating two sawmills, a rock quarry, and a water point. From 17 to 19 December, engineers from the 35th and 158th Engineer Combat Battalions held critical positions on the outskirts of Bastogne and helped delay the German advance until the 101st Airborne Division moved into town and held it throughout the coming siege. At Ortheville, 10 miles west of Bastogne, Soldiers of the 299th Engineer Combat Battalion defended a Bailey bridge over the Ourthe River for 2 days. The engineers had delayed the German advance because the bridge was vital for resupplies of gasoline and ammunition into Bastogne. By the end of 20 December, the 299th had barred the way to Germans seeking to bypass the town.[14]

At the southernmost portion of the VIII Corps front, the Our River flowed into the Sauer, which formed the boundary between Luxembourg and Germany. The German 7th Army, composed of two infantry corps, attacked there on 16 December. The 103d Engineer Combat Battalion, attached to the 109th U.S. Infantry Regiment of the 28th Infantry Division, was tasked with delaying the Germans. For 4 days, the outnumbered defenders disrupted enemy plans. The engineers established roadblocks, manned outposts, and made a considerable contribution. One platoon, patrolling roads in the forward area, captured 12 Germans before it was forced to withdraw.[15]

On the morning of 23 December, the engineers awoke to find that the heavy clouds had gone and the skies were clearing. Soon, they heard the drone of American planes passing overhead. The next morning, U.S. Third Army infantry Soldiers began to relieve the engineers as Lieutenant General George S. Patton swung the bulk of his troops north to pound the German southern flank, relieve Bastogne, and help end the Battle of the Bulge.[16]

Lieutenant General Middleton credited the engineers with doing "a magnificent job" as infantry in repulsing the Germans in the Ardennes. On the other hand, the VIII Corps engineer and various engineer group commanders believed that the engineer combat battalions could have done more to impede the German advance had they been employed not in the front line, but in a tactically unified second line of defense in the rear in the western part of the corps area. Yet at crucial points on the front, divisional engineers were the only troops on the scene when the Germans struck. The engineers were able to upset the German timetable, delaying the onrushing columns long enough for American reinforcements to be brought to the five main areas of resistance throughout the Ardennes.[17]



Courtesy Office of History, Corps of Engineers

Construction of this Bailey bridge at Grand Halleux, Belgium, was finished despite heavy enemy fire.



Courtesy Office of History, Corps of Engineers

Company A, 291st Engineer Combat Battalion operated this sawmill at Viesalm, Belgium.

It is difficult to determine how much the Army engineer, artillery, and other small detachments delayed the German advance, but there is no question that the LVIII Panzer Corps was diverted from the mainstream of the western advance by these efforts, depleting the spearhead strength of Fifth Panzer Army. For this latter purpose, Lieutenant General Middleton would have had some 3,300 engineers in addition to those organic in the divisions. But it is questionable whether the 7th Armored Division would have had time to establish itself at St. Vith, not to speak of the 101st Airborne Division at Bastogne, without the direct intervention of the engineer battalions. It is clear that the use of engineers in their capacity as trained technicians often paid greater dividends than their use as infantry, and that a squad equipped with sufficient TNT could, in the right spot, do more to slow the enemy advance than a company armed with rifles and machine guns.[18]

The Ardennes attack would not be Hitler's last major offensive of the war. The Allies would still have to counter a massive envelopment of the U.S. Seventh Army just south of the Ardennes. By 28 December, the Seventh Army had conducted a phased withdrawal through three defensive lines. Three veteran engineer combat regiments conducted much of the engineer work, requiring the Germans to exhaust themselves on the strong American lines in the Colmar Pocket. Counterattacks soon followed with the First, Third, and Seventh Armies advancing through the Siegfried Line.[19]

During the Allied offensives that began by early January 1945, engineer units were generally released from their infantry role and reverted to the task of assisting the combat troops to move forward. The weather turned bitterly cold, and snow and ice covered the roads. Working sometimes in blinding snowstorms, the engineers (aided in some areas by German civilian laborers) scattered cinders and gravel on the roads.[20]

Although German forces largely went over to the defensive after the Battle of the Bulge, the Allies would still have to cross the Rhine River and advance through Germany to link up with the Soviets driving from the east. American engineers would play a large role in those operations and in efforts to reconstruct Germany after the war ended. The engineers had shown themselves at their best in a variety of roles in critical situations.

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New Metric:

Measuring Retrograde Progress in Afghanistan

By Captain Thomas N. Page, Captain Nicholas G. Vottero, and Mr. Thomas A. Clark

Following the 11 September 2001 terrorist attacks, the United States began combat operations in Afghanistan with the strategic objective to deny a terrorist safe haven from which an attack could be planned or launched. Ancillary goals were to liberate an oppressed country from Taliban rule and build an Afghan police force and army to protect its citizens. This was a challenging undertaking. At its peak, the United States and its North Atlantic Treaty Organization allies had deployed more than 100,000 Soldiers, Marines, Sailors, and Airmen to Afghanistan; had built more than 800 operating bases and posts to support those forces; and had formed and trained an Afghan army of more than 200,000 Soldiers. After more than 12 years of war, the United States and its allies have now entered the final stages of their efforts in Afghanistan and the focus has shifted to retrograde operations and reducing the footprint in Afghanistan. As the United States prepares to transition out of the longest war in its history, a new set of goals must be established to deliberately withdraw Soldiers, remove support infrastructure, and end combat operations by December 2014.

In 2013, the 92d Engineer Battalion supported retrograde operations in Afghanistan as part of the U.S. Central Command Materiel Recovery Element. The U.S. Army construction battalion had unique objectives and challenges compared to other deployed units that were executing traditional, population-focused counterinsurgency missions. One of the initial challenges was to define what mission accomplishment looked like. The 92d leaders understood that they were sent to Afghanistan to remove infrastructure and reduce the footprint in Regional Command (South) and Regional Command (Southwest). However, initially they were not sure how to quantify progress. All goals must have an established deadline, a means to measure results, and an achievable end. While there was a clear strategic deadline, they were unsure how to measure success and what they were capable of in a role that was primarily deconstruction. Upon arrival to Afghanistan in January 2013, they made it a priority to find a way to measure the necessary operations to tear down tactical infrastructure across Afghanistan. The starting point was to look at the historic means to measure logistic volume and throughput, the 20-foot equivalent unit (TEU).

Historical Measurements

Across sustainment organizations and materiel recovery teams in Afghanistan, the TEU has served as the historical means to measure the amount of equipment sent overseas. Consequently, it was the first metric repurposed to measure retrograde progress. The TEU refers to a standard, 20-foot shipping container. As a very specific measurement used by the U.S. military to move supplies and equipment, it provides a simple means of



Soldiers mobilizing with the 489th Engineer Battalion, Little Rock, Arkansas, practice vehicle recovery in preparation for a future retrograde mission in Afghanistan.



Soldiers dismantle a bunker at Forward Operating Base Wolverine during the retrograde process in Zabul Province, Afghanistan.

tracking progress related to the war in Afghanistan. Records can determine how many TEUs have been sent to Afghanistan and can, therefore, be used to track the amount of equipment destroyed or retrograded out of combat zones. However, it soon became clear that the TEU is a broad and limited measurement, especially when defining deconstruction progress across a country. The TEU is an effective tool for logisticians to measure throughput and estimate in-country resources. However, the United States is reducing its presence in Afghanistan, where tens of thousands of Soldiers, thousands of vehicles, and vast amounts of infrastructure need to be removed, destroyed, or left behind. Consequently, the materiel that the 92d would handle could not simply be packed into 20-foot containers.

A second limitation of the TEU is that, after 12 years of war, it is difficult to account for all TEUs in Afghanistan. Thousands of containers have been sent between Afghanistan and the United States. Thousands have remained in Afghanistan even as units have departed. As a construction battalion, we encountered dozens of containers; some were full of equipment that was unaccounted for and others were completely empty. It would be impossible to determine what to leave behind without an accurate understanding of what is currently in-country. Also, not all TEUs are created equal. There is not necessarily a direct correlation between TEUs and troop levels in Afghanistan. Filling a 20-foot container with mission-essential equipment is not the same as filling it with morale and welfare supplies. Therefore, removing TEUs does not necessarily correlate to the reduction of forces in Afghanistan. It was more important to remove the facilities that Soldiers occupied and the equipment they used. The TEU provides a general idea of how much equipment and supplies are present in Afghanistan, but it does not provide information on the size of the area of responsibility—the footprint—of American forces. A unit footprint consists of administrative and office buildings, barriers, living quarters, dining facilities, and gymnasium and recreational facilities, most of which will never be put in containers and sent back to the United States. It soon became clear that the TEU was of little use in understanding our capabilities or measuring our progress.

The second most common way of measuring retrograde progress is to tally base closures and handovers against the original list of existing bases. However, this method does not properly indicate the size, contents, special infrastructure, or time needed for engineers to deconstruct these items before the withdrawal of the occupying unit. Some bases simply provide living quarters for platoon-size elements, while other bases are strategic aerial ports of debarkation and home to division-size elements. Closing the latter would obviously be more resource-intensive, but there was no distinctive measurement of the engineer effort required based on the size of the installation or its population. All bases are not created equal. As engineers conducting retrograde operations, the 92d Engineer Battalion needed standardization regarding the deconstruction of U.S. bases. This need resulted in the creation of a new metric.

A New Unit of Measurement

A battalion-equivalent unit (BEU) represents the quantity of tactical infrastructure needed to support one battalion of Soldiers. One BEU would equal a military battalion moved off-location with the complete removal of its support structures and equipment. Also, no portion of those structures or equipment can be backfilled by other coalition forces or transferred to Afghanistan National Security Forces. This means of measurement would account for all aspects of tactical bases needed to support a battalion, to include—

- Living areas.
- Working areas.
- Force protection.
- Support facilities.
- Life support facilities.
- U.S. Army Family and Morale, Welfare, and Recreation facilities.
- All other aspects of life support systems.

One benefit of using the BEU is that it measures more than the total number of bases remaining in Afghanistan. It takes into account the uniqueness of each piece of tactical infrastructure, converting each piece into a measurable quantity. Therefore, it provides a means to measure the amount of work done or undone.

Because there was a known number of U.S. Soldiers at forward operating bases at the height of Operation Enduring Freedom, the BEU can be used to establish a baseline when applied to the problem of quantifying the U.S. footprint. While it is difficult to determine the amount of life support equipment that is in-country using the TEU, there are a precise number of U.S. troops in Afghanistan and a correlated level of resources present to support those troops. Therefore, based on the number of Soldiers expected to remain in Afghanistan after 2014, there would be a related number of BEUs required to support them, which would indicate an end point for the base reduction mission.

The basis of the BEU came from numerous publications and pamphlets about contingency base camps and base camp construction. The publications define the type and quantity of life support facilities needed based on the number of forces on-site. A standard operating procedure for base closure published by U.S. Forces–Afghanistan in April 2013 is the primary publication describing specific plans for base closures, but it does not provide a means of measurement or a system for tracking the overall demilitarization of U.S. Central Command contingency bases in Afghanistan.

The BEU accounts for the support that a battalion-size element needs to accomplish its mission, to include living and working areas, force protection infrastructure, life support and recreational facilities, and special mission support facilities. The exact number of BEUs is based on the man-hours required to deconstruct each piece of infrastructure.

Take-Away

The most significant advantage to the BEU is that it is measurable. There is a quantifiable number of BEUs in Afghanistan, based on the number and size of bases throughout the country. A strategic base could have more than 10 BEUs, whereas a small combat outpost might have only 0.25 BEUs. It would be impractical to represent the retrograde work needed to be done simply by the number of bases because they are not uniform. BEUs are directly proportional to the reduction of forces in Afghanistan, not the number of bases or the amount of equipment they contain. Another advantage of using the BEU was that it allowed leaders to determine the maximum efficiency of the 92d Engineers as a deconstruction battalion. They calculated the maximum BEU workload assuming that the battalion companies were organized with one vertical platoon and two horizontal platoons and deployed for 270 days. More importantly, the calculated rates of work allowed realistic goals to be established. Given the working constraints throughout the 9-month deployment, leaders concluded that the battalion completed only about 33 percent of the possible total work. Efficiency was most negatively influenced by customers who delayed project timelines, contractors who delayed displacement, and competing requirements to perform traditional construction missions. Frequently, there was a bias for delay at the customer and battlespace owner level due to the inertia and comfort of the status quo.

The BEU also has strategic implications. It is a practical measurement that should be used by Afghanistan policy makers to capture the scope of the problem with appropriate metrics and use that information to make decisions. The BEU displays how much work remains to be done and, when combined with start and end dates, creates a boundary which should influence decision points that drive the application of resources. Based on data points now available, base population is most directly correlated to tactical infrastructure deconstruction requirements. The BEU should be used as a tool to display the size of the problem and drive a sense of urgency in tackling the problem. As the final phases of the war in Afghanistan continue, the BEU can be used to establish priorities for deconstruction and retrograde operations and drive deployment considerations for deconstruction units.

Limitations

While the BEU has many advantages over the TEU, it is not a perfect unit of measurement. One drawback is that the makeup of the BEU changes based on the area of operation. For instance, the 92d Engineer Battalion operated primarily in Regional



A rough-terrain container handler passes by the entrance of the Forward Operating Base Sharana materiel redistribution yard.

Command (Southwest) and Regional Command (South). Force protection in the latter primarily used Hesco Bastion Concertainers® with different fill materials than the Hescos that are found in other regional commands. It would have taken longer to remove the equivalent number of containers if operating in a different regional command. This would increase the man-hours needed to remove the force protection and, therefore, equal a BEU. While the BEU is a general measurement, a construction battalion would face different challenges in different areas of operation. Just as laws and regulations change across U.S. city and state lines, the regional commands in Afghanistan and the coalition forces supporting them must follow differing local rules. For example, the disposal requirements of used Hesco containers change per region. In some places, they may be given away to the locals; in others, they must be buried; and in yet other places, they must be melted down. Each requirement would affect the timeline of retrograde operations differently.

Another limitation of the BEU is that after 12 years of war, not all deployed battalion-size elements have the exact amount of resources needed to survive and conduct operations. Several bases have more facilities and resources than needed for the personnel on-site. As a result, more BEUs would need to be removed than the number of Soldiers on the ground would suggest. One way to counter this would be to require units to report their tactical infrastructure footprint into a database, which would result in a precise account of what is in-country. Unfortunately, there is no reporting requirement for units currently deployed.

Conclusion

While there is not a perfect metric to determine retrograde progress in Afghanistan, the BEU accurately and appropriately captures the scope of the problem. As a construction battalion deployed to Afghanistan from January to November 2013, it was essential to develop a metric that allowed us to establish measureable goals, determine our capabilities, and quantify our progress. The BEU fulfilled these needs at the battalion level. Furthermore, the BEU should be used by military planners and leaders to establish strategic goals and prioritize resources to fulfill objectives by set deadlines.

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Mr. Clark served as battalion intelligence officer in the 92d Engineer Battalion. He holds a bachelor's degree in engineering management from the U.S. Military Academy and is now pursuing his master's degree in business administration from the Emory University Goizueta Business School.

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The High-Mobility Engineer Excavator and Backhoe Loader

By Major William E. South

During a commander's update briefing at a recent Warrior Exercise at Fort McCoy, Wisconsin, the commander of an engineer battalion task force asked the audience, "What do you call those Decepticon-looking backhoes down in the 357th Engineer Support Company motor pool?"[1] The question was posed as a joke, but many of the experienced engineer officers and senior noncommissioned officers in the room could not answer it. The piece of equipment in question was the high-mobility engineer excavator (HMEE), with its massive, armored cab and large, 1.5-cubic-yard front bucket.

The HMEE (commonly pronounced *him-me*) is the wheeled excavator that replaced the small emplacement excavator (SEE), which had been in the Army inventory since 1990. The SEE life cycle ended in 2005, but it is still being phased out of the inventory today. The original plan for the HMEE program was to include three variants, and fielding of the HMEE-I began in 2007. The HMEE-II was intended to be smaller and lighter to meet the transport requirements of airborne and air assault units. The HMEE-III would be a commercial, off-the-shelf product that would primarily be fielded (without major modifications) to construction units. In 2006, the HMEE-III was renamed the backhoe loader (BHL) and became a separate acquisition program. The need for the HMEE-II was overcome by events, allowing the HMEE to drop the -I designation for the first variant.

Both platforms are now widely fielded across the Engineer Regiment, with 708 HMEEs and 639 BHLs in the Army inventory. The HMEE and BHL appear on tables of organization and equipment for a wide range of baseline engineer units. To tailor the engineer force to provide the right mission support, engineer planners should know to which formations they are assigned and the capabilities and limitations of each piece of equipment.

According to a spokesman for Construction Equipment and Material Handling Equipment at the Program Executive Office–Combat Support and Combat Service Support, the HMEE is a nondevelopmental item uniquely made for the military. Its features include—

- All-wheel drive.
- Turbo diesel engine.
- Antilock brakes.
- Backhoe.



The HMEE has a top speed of 60 miles per hour.

High-Mobility Engineer Excavator
Brigade engineer company (Stryker BCT)
Brigade engineer company (Heavy BCT)
Combat engineer company, brigade engineer battalion (Airborne BCT)
Combat engineer company, brigade engineer battalion (Infantry BCT)
Combat engineer company, brigade engineer battalion (Stryker BCT)
Engineer company, brigade special troops battalion (Infantry BCT)
Engineer company, brigade special troops battalion (Airborne BCT)
Engineer support company
Clearance company
Multirole bridge company
Backhoe Loader
Horizontal construction company
Vertical construction company
Maintenance company, special forces group support battalion
Quartermaster petroleum pipeline and terminal operating company
Quartermaster water purification and distribution company
Quartermaster water support company
Quartermaster force provider company
Headquarters and headquarters company, military police detention battalion
Transportation railway operating company

Legend:
BCT - brigade combat team

Figure 1. Companies authorized HMEE or BHL

- Bucket loader.
- Other available attachments.
- Self-deployable operation (no truck/trailer combination required).
- Maximum speed of 60 miles per hour on improved roads, 25 miles per hour off-road.
- Air-transportable movement on C-130 aircraft.

As a self-deployable asset, the HMEE can maintain convoy speeds with the maneuver element. The vehicle is low-velocity, air drop-capable with proper equipment, which made the proposed HMEE-II variant unnecessary for airborne and air assault engineers.

According to the operational needs statement, the HMEE mission is part of the rapid, tactical earthmoving forces and is used for the following:

- Clearing rubble and debris from routes and airfields.
- Constructing airstrips.
- Providing survivability positions for critical assets like mission command, radar, and logistics.
- Improving forward sites.
- Supporting limited combat support and combat service support missions in forward areas.

The HMEE must be capable of rapidly performing excavation tasks and then quickly self-deploying to the next mission site. There is at least one documented case of an operator's life being saved by the removable crew protection kit when the HMEE struck an antitank mine. Even with its armor, the HMEE was not intended to perform large-area earthmoving tasks, area clearance, or assault breaching.

Quick-disconnect couplings on the backhoe and front bucket allow auxiliary hydraulic attachments to be fitted and operated by the vehicle hydraulic system. Basic issue items such as an auger, a rock breaker, or a compactor can be attached to the rear couplings. The front couplings can operate a sweeper, snowblower, sandbag filler, or 6,000-pound fork. (The front attachments are not included with the basic issue and must be ordered separately.)



Soldiers of the 22d Engineer Clearance Company practice operating the HMEE-I by digging trenches at Joint Base Lewis-McChord, Washington.

For vertical and horizontal engineer companies and combat service support formations, the BHL replaced the SEE and the John Deere™ 410-D backhoes still in the Army inventory. Since the BHL was intended to support units that operate at a fixed location and rarely maneuver on the battlefield, it does not require the speed of a HMEE. With a maximum speed of 23 miles per hour on improved roads and 7 miles per hour off-road, the BHL requires a haul asset such as an M916 tractor and M870 trailer to transport it over longer distances. With a smaller chassis, smaller wheels, and narrower buckets, the BHL is more maneuverable than the HMEE on the jobsite and is capable of more precise excavation tasks. There is also a crew protection kit available for the BHL, which will protect the operator from small-arms fire or fragmentation from buried munitions. In addition to the crew protection kit, a visibility improvement package is available. It includes four externally mounted cameras connected to three internal monitors to give the operator ground level vision of the entire work area.[2]

With its armor and mobility, the HMEE gives the engineer force the capabilities required for initial theater entry. The HMEE is an integral piece of equipment to support shaping operations and then transition into defensive and offensive operations. As a digging asset (with additional attachments), the HMEE also lends itself as an engineer multiplier during stability operations. As the spectrum of operations swings fully into stability operations and baseline general engineer units appear in greater strength in the theater of operations, the BHL would be fully capable of performing general construction excavation tasks to support stability operations.

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Major South deployed as a vertical construction platoon leader in B Company, 926th Engineer Battalion, in support of Operation Enduring Freedom in 2004 and recently commanded the 375th Engineer Company (Vertical), 467th Engineer Battalion, U.S. Army Reserve. He holds a bachelor of science degree from the University of North Alabama and a master's degree in accountancy from Auburn University. He is a project management professional and a certified defense financial manager.

Endnotes:

[1]Decepticons are characters in the Transformers® line of comic books, cartoons, and movies.

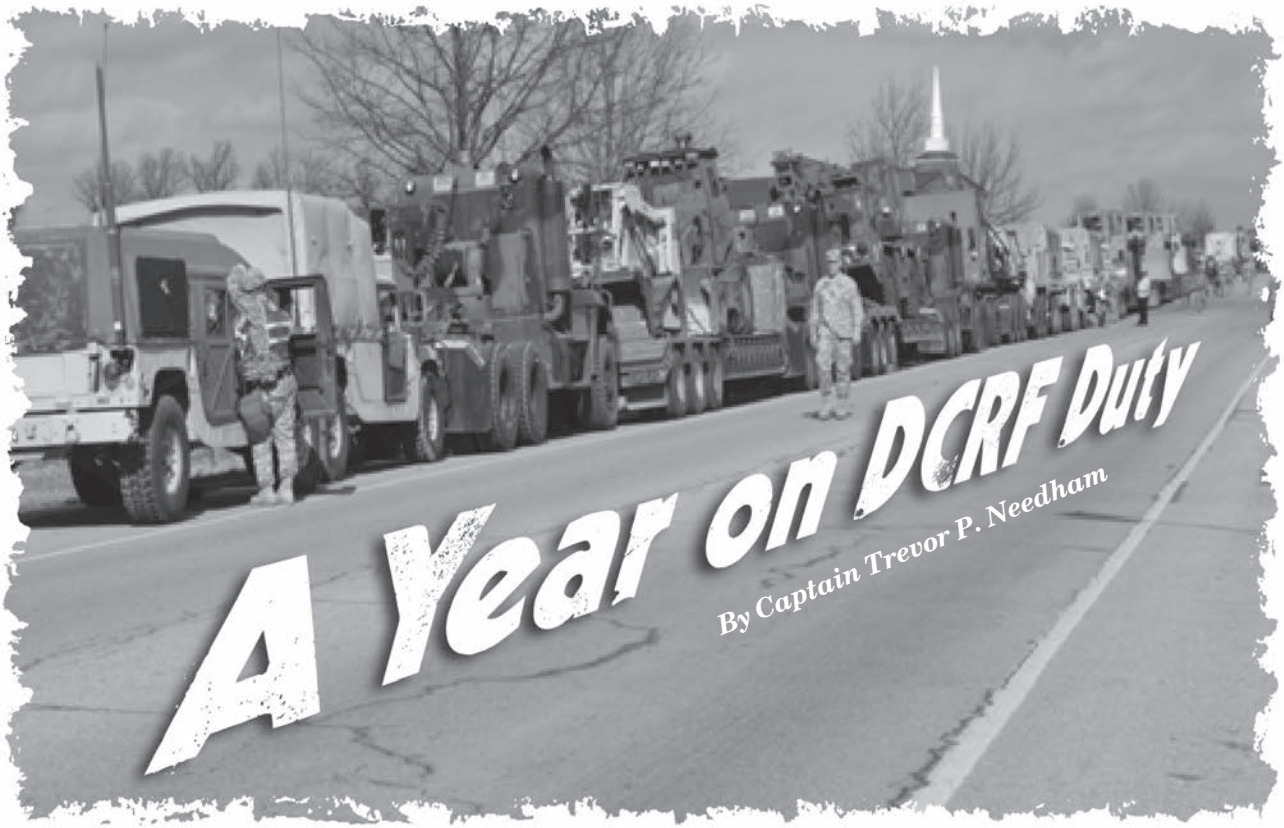
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A Year on DCRF Duty

By Captain Trevor P. Needham

In October 2013, the 103d Engineer Company, 94th Engineer Battalion, 4th Maneuver Enhancement Brigade, completed a year supporting the Defense Chemical, Biological, Radiological, Nuclear, and Explosive Response Force (DCRF). The Engineer Regiment supports the U.S. Army Forces Command DCRF mission every year with one battalion and two companies to provide critical engineer support in the event of a chemical, biological, radiological, nuclear, and explosives (CBRNE) strike or accident on U.S. soil. The 103d Engineers supported task force operations with a 24-hour rapid deployment requirement. After finishing company certification training during field training exercise Vibrant Response 15 at Camp Atterbury, Indiana, the company completed a series of training events and challenges to sustain its readiness for the 12-month mission.



Soldiers from the 103d Engineer Company remove rubble, including a crumpled automobile, from the site of a mock urban disaster.

The 103d Engineer Company was the test unit tasked to create the first N-hour sequence for rapid deployment on Fort Leonard Wood, Missouri. This is the same deployment sequence that the 4th Maneuver Enhancement Brigade headquarters would follow when the unit later assumed DCRF operations. Devising the sequence required a post-wide effort that integrated actions by the installation garrison, Department of the Army civilians, local civilian law enforcement agencies, and 4th Maneuver Enhancement Brigade Soldiers. The N-hour sequence was verified and tested on three occasions through emergency deployment readiness exercises conducted by the 1st Infantry Division, the brigade higher headquarters. As a test, the N-hour sequences were

initiated numerous times in the middle of the night with no notice. The 103d Engineers validated Fort Leonard Wood as a deployment platform by being the first unit on the installation to pass a Level III emergency deployment readiness exercise.

As part of Force Package 1, the 103d Engineer Company was tasked to respond to emergencies by ground convoy within 24 yours, which was to be followed at intervals by three other force packages. The company faced multiple challenges to meet the deployment sequence from Fort Leonard Wood. Located in the central United States, Fort Leonard Wood is a convenient location for ground movement to locations on either coast. The company was also required to maintain an initial response package (IRP) of one platoon with equipment, which was required to deploy by air within 24 hours. Outfitted with wheeled and tracked heavy construction equipment, this was no easy task. To meet mission requirements, the IRP platoon maintained a 2-hour recall with a strict load-out sequence. The nearest airport able to move the IRP was in Springfield, Missouri, a 3-hour convoy drive from Fort Leonard Wood, further compressing the deployment timeline. Platoons assumed IRP duty on a monthly rotation after undergoing a thorough equipment inspection to validate load plans and vehicle readiness and to identify and correct deficiencies.

Unit readiness and sustainment posed significant challenges throughout the yearlong tasking. Soldiers required more than 80 hours of additional training in CBRNE operations, Federal Emergency Management Agency policies, and legal topics before they were mission-capable. The additional training helped Soldiers feel comfortable negotiating the



Above and below: **Soldiers learn rigging and delayering operations from a Federal Emergency Management Agency heavy rigging specialist during an equipment rodeo in January 2013.**





In a certification exercise scenario, Soldiers remove rubble that is blocking rescuers from responding to a building collapse in search of survivors.

complex situations encountered when federal forces operate within the United States. The requirements were a constant strain on the unit due to a 10 percent monthly attrition rate that was backfilled by new Soldiers who required train-up. To meet these challenges, the company conducted monthly, medical readiness processing and driver training and also provided online resources. By aggressively pursuing individual readiness, the company achieved and maintained the 90 percent deployable requirement.

"The horizontal construction company also learned how to use its equipment . . . to rescue people trapped in collapsed structures without endangering the victims or rescuers."

The platoons and squads of the 103d Engineer Company also required unique collective training to enable their operators to perform in a CBRNE environment. The diverse mission requirements are some of the greatest challenges in providing engineer support to DCRF. Without knowing how a disaster or attack may occur, there is no way to predict what tasks or assets will be required. To better integrate with civilian emergency responders, the 103d conducted a week-long DCRF equipment rodeo with a heavy rigging specialist from a Federal Emergency Management Agency search and rescue team. He helped the Soldiers and leaders understand what capabilities both sides bring to an emergency and how to use each other's strengths. The horizontal construction company also learned how to use its equipment for vertical delayering to rescue people trapped in collapsed structures without endangering the victims or rescuers. The certifying exercise for each platoon was to retrieve watermelons trapped beneath tons of rubble while wearing Level 4 mission-oriented protective posture equipment.

The 103d Engineer Company proved the ability of the Engineer Regiment to respond to any situation. With defense support of civil authorities missions increasing and operations in support of Operation Enduring Freedom decreasing, the lessons learned and skills developed by the 103d Engineer Company and 94th Engineer Battalion will provide a solid base for future support. As the company came off DCRF duty, the 4th Maneuver Enhancement Brigade headquarters assumed the role of task force operations, thus maintaining the momentum of a successful year.

Captain Needham is an Army Reservist serving as a facilities management engineer for U.S. Communications–Electronics Command at Aberdeen Proving Ground, Maryland. When he wrote this article, he was the commander of 103d Engineer Company. He is a graduate of the Engineer Captains Career Course and the Sapper Leader Course. He holds a bachelor's degree in chemistry from the University of Scranton, Scranton, Pennsylvania; and a master's degree in environmental engineering from Missouri University of Science and Technology at Rolla. He is currently a Ph.D. student in environmental engineering and a research assistant at the University of Maryland, Baltimore County.

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- To place service before profit, the honor and standing of the profession before personal advantage, and the public welfare above all other considerations.

In humility and with the need for divine guidance, I make this pledge.

Adopted by National Society of Professional Engineers, June 1954





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