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Front cover: Soldiers from the Missouri Army National Guard 1438th Multi-Role Bridging Company out of Macon, Missouri, repair a bridge in Regional Command South, Afghanistan.

Back cover: ENFORCE Week 2014 (Photos by Fort Leonard Wood Visual Information Center)

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Clear the Way

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

The Senior Engineer Leadership Council (SELC) was a great event to conclude the month of April. Our theme this year was the Regiment of Opportunities. The SELC gave us a forum to discuss our efforts to shape the engineer force today and through 2025 and beyond. Our U.S. Army Engineer School team hosted engineer leaders from all Army components and engineer commands to plot our trajectory for the coming decades to posture the Regiment with the capabilities needed to support the entire range of military operations. We hosted our discussions through Defense Connect Online (DCO) in order to maximize participation, and the discussions are available on the Engineer School Knowledge Network (ESKN) at <https://www.us.army.mil/suite/page/637460>. Engineer Regimental Week activities began with the Army Engineer Association Industry Day, which included a ceremony and tribute to our Fallen Sappers. The week ended with the annual Engineer Ball, where we recognized our best units and leaders from across the Regiment.

The SELC provided a forum to discuss how we are currently drawing down personnel and forces while simultaneously being charged to produce a future Army with capabilities equal to or greater than those we possess today. Our requirement for a credible and capable force to prevent, shape, and win conflicts will remain through a changing and challenging operational environment. We may not get the future force exactly right, but through collaborative and informed discussions, we should avoid getting it completely wrong and lose the edge we possess to deter or compel future adversaries. The SELC provided a significant step in avoiding this outcome and meeting anticipated requirements while taking advantage of opportunities in the midst of many changes.

Some of the highlights from the conference included discussions on our force structure changes and the implementation of the brigade engineer battalions and our geospatial intelligence and geospatial planning cells. These changes are already having a positive impact within the brigade combat teams and providing increased mission command for a complex mission set. Our geospatial changes are providing increased synergy and providing capability at nearly every command level in most brigades and above. We are also concluding the development of the new structure of the construction company in the echelons above brigade (EAB) organization, and we are beginning to redesign the combat engineer company in the EAB. The construction company force design update is still pending approval at Headquarters, Department of the Army. It will provide us with a more agile, multifunctional, and expeditionary design than our current modular table of organization and equipment units. These organizations will likely continue to evolve in the future as we move toward the Force 2025 structure.

The Army has also made a significant investment in material fielding for the Engineer Regiment. We discussed the latest in fielding construction equipment, the M2A3/M2SA Bradley fighting vehicle, assault breacher vehicle, joint assault bridge, medium mine-protected vehicle, handheld detector, and many other systems. All are making steady progress and improve our capabilities across the force.

We discussed expanding opportunities for our officers, noncommissioned officers, Soldiers, and civilians. In particular, we are working to increase our degrees, credentials, and certifications for the Regiment. This is an important part of the foundation of our profession. As part of building professionals, we are expanding our role in talent management with the U.S. Army Human Resources Command and field commanders to ensure that we get the right leaders into the right positions. We are balancing opportunities to broaden our commissioned officers, warrant officers, and senior noncommissioned officers with operational experience. It is important for our future leaders of Force 2025 to understand how the big Army works and some of the larger strategic challenges we face.

We also discussed Soldier 2020 and the opening of combat engineer positions to females. We anticipate that all officer positions will soon open to females and that our military occupational specialty 12B (combat engineer) enlisted positions will open to females in fiscal year 2016. The Army is developing a gender-neutral physical demand standard for enlisted positions that should be approved and implemented concurrently.

(Continued on page 6)

Lead the Way

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

Hello again, my fellow engineers and Families of our great Regiment. During the last couple of months, I had the pleasure of visiting some units and speaking with our great leaders and Soldiers. One of my visits was with the 36th Engineer Brigade at Fort Hood, Texas, during their engineer week; and they put on an astonishing display of events. I had a splendid time with the formations, watching them transition some of the battalions into the "Stay Rugged" brigade. I closed out the week by attending the Engineer Ball at Fort Hood; listening to guest speaker Lieutenant General Thomas P. Bostick, Chief of Engineers; and reminiscing the night away with fellow engineers.

Brigadier General Anthony C. Funkhouser and I were invited to visit Fort McCoy, Wisconsin, to watch the Sapper Stakes competition there. It was a grueling, 4-day event in which engineer squads were tested on 12 tasks and gained vast knowledge on engineer tasks and clearance operation missions. Thank you to the 416th Theater Engineer Command, 412th Theater Engineer Command, and 1st Army for gathering Sappers together and getting after engineering fundamentals.

At Fort Bragg, North Carolina, the Soldiers of the 307th Engineer Battalion finally went back home to where they truly belong—the 82d Airborne Division as part of the 3d Brigade Combat Team. During my visit to Fort Bragg, I talked with some of the leaders and Soldiers of the 20th Engineer Brigade and the 82d Airborne Division.

I enjoyed the mountains and desert of Fort Bliss, Texas, while speaking with numerous leaders of the 1st Armored Division. I also spoke with young enlisted Soldiers about the future of the Regiment and the U.S. Army. The 16th Engineer Battalion did a spectacular job hosting Sergeant Major Christopher J. Walton, Engineer Personnel Development Office, and me during our trip. Class 64 graduated from the U.S. Army Sergeants Major Academy on 6 June, and we commend the new leaders back into diverse formations. The class consisted of nine Regular Army, one Army National Guard, and four U.S. Army Reserve NCOs who will have greater responsibilities, since some of the students will go straight into command sergeant major billets. Again, I enjoyed mentoring and dining with the newest sergeants major and command sergeants major of the Regiment.

I would like to take a minute to discuss the Senior Engineer Leadership Council (SELC) which was held at Fort Leonard Wood, Missouri, in May. The great staff and teammates of the U.S. Army Engineer School put together a great agenda, which involved the Commandant's opening remarks about the Engineer Regiment, the brigade engineer battalion initiative, the building of professionals, Soldier 2020, and Engineer 2025. The team was honored to have Lieutenant General Bostick; Major General Todd T. Semonite, deputy chief of engineers and deputy commanding general of the U.S. Corps of Army Engineers; Command Sergeant Major Robert A. Winzenried, North American Aerospace Defense Command and U.S. Northern Command; and Command Sergeant Major Karl J. Groninger, Headquarters, U.S. Army Corps of Engineers, attend the memorial ceremonies and the Engineer Ball. Sergeant Major of the Army and Mrs. Raymond F. Chandler III were also present to observe training, speak with Family members, and attend the Fallen Sapper memorial ceremony. We closed out the Engineer Ball by presenting the Gold de Fleury Medal to Major General Merdith W.B. Temple (Retired) and honoring the winners of the Sturgis Medal, the Van Autreve Award, the Itschner Award, the Best Platoon Leader Award, and the Best Warrant Officer Award. If you did not get a chance to attend the SELC, I recommend that you go to the Engineer School Knowledge Network at <https://www.us.army.mil/suite/page/637460> to view the events and discussions. There are a lot of things happening in our prodigious Regiment.

In closing, I want to talk about the downsizing of the Army. We must ensure that our leaders are talking to Soldiers and other leaders about different options inside and outside the Regiment. All three components will be affected by changes in the force structure, and we need to educate our Soldiers and provide them with facts and scenarios to ensure that we are taking care of them and their Families.

Show the Way

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

As I wrote this, we were about to kick off the Senior Engineer Leadership Council, formerly known as ENFORCE. Unfortunately, due to Department of the Army-mandated restrictions on conferences, this year's event was limited to a very small and select group of leaders, but the Engineer Regiment met the challenge by providing access to the briefings and documents for everyone through various methods via the Internet. This year, the conference focused on the significant changes occurring within the Army and the Engineer Regiment. Some of these changes will appear daunting, but as engineers, it's in our DNA to identify and solve the hard problems. Engineer warrant officers, as the primary advisors to commanders and staff officers, will play a significant role in that process.

Speaking of the warrant officer's role as an advisor, the Chief of Staff of the Army (CSA) recently announced that he selected Chief Warrant Officer Five David Williams to be the Army's first Army Staff Senior Warrant Officer (ARSTAF SWO). The position is coded as CW5 011A (branch immaterial), and all qualified chief warrant officers five will be eligible to compete for the position. The ARSTAF SWO will work directly for the CSA, advising the CSA on issues affecting the warrant officer cohort across the Army. This is a major step toward integrating warrant officers into all levels of the Army, reflecting the importance that the CSA places on warrant officers.

"Warrant officers are technicians that can lead," to borrow a definition from our new ARSTAF SWO; and the CSA sees warrant officers filling areas of technical expertise that were formerly filled by contractors. This will allow the Army to reduce its expenditures on contractors.

There is big news for engineer warrant officers as well. The brigade engineer battalions that began standing up this year have a chief warrant officer two construction engineering technician, military occupational specialty (MOS) 120A, serving on the battalion staff. This moved the technician out of the platoon level up to the battalion staff, thus expanding that role to be the battalion commander's advisor and planner for construction-related operations. The construction engineering technician will also serve as part of the brigade combat team (BCT) operational energy advisor staff, which advises BCT commanders on the efficient use of operational energy to reduce the logistical impacts of meeting the energy requirements of deployed BCTs. The MOS 120A Warrant Officer Basic Course has been updated to reflect these new duties so that graduating warrant officers will be better prepared for the additional responsibilities.

The geospatial force design update also brings changes for geospatial engineering technicians (MOS 125D). The most significant change adds a geospatial engineering technician to the engineer brigade and creates additional geospatial planning cells for all Army Service component command headquarters, to include one for the U.S. Army Special Operations Command. The geospatial engineering technician in the engineer brigade, along with the increase of three geospatial engineer enlisted Soldiers (MOS 12Y), will provide the brigade commander with a robust geospatial engineering capability greater than that of a BCT and nearly as large as a division geospatial team—eight geospatial personnel in the engineer brigade compared to nine in a division and corps.

This increased capability comes with an increase in mission, designed to fill a gap that became apparent during deployments over the last dozen years. The engineer brigade commander, as the corps and/or joint operational area engineer, will task the geospatial engineering technician and will manage the standard and shareable geospatial foundation for deployed units in-country. The engineer brigade geospatial team will also be the conduit to the Army service component command geospatial planning cell for geospatial data updates coming into and out of country.

Lastly, fiscal year 2014 launches a long-awaited, training-with-industry (TWI) opportunity for engineer warrant officers. We are inaugurating our TWI by sending Chief Warrant Officer Three Erik Reid, a geospatial engineering technician, to work with the Environmental Systems Research Institute at their headquarters, campus, and research and development facility in Redlands, California. He will work with software engineers and training developers for a year, followed by a reutilization assignment at the U.S. Army Engineer School as a 125D training developer/writer to incorporate the latest Environmental

Systems Research Institute techniques and practices into our warrant officer curriculum. We are also working to develop a TWI opportunity for 120A construction engineering technicians for fiscal year 2015. Our long-term goals are to alternate annual TWI opportunities between the two specialties to allow warrant officers from each MOS to compete every 2 years.

Even though we are in a time of transition, with budgetary constraints and many uncertainties, the future for engineer warrant officers looks bright. Our roles and responsibilities are increasing, and our assignment and training opportunities are expanding. But with all of that, we must never lose sight of our primary role as the Army's technical experts of our tradecraft. So, sharpen your skills, maintain flexibility, and be on the lookout for opportunities to show your value. To help you be better prepared to accomplish this, I offer these keys to success:

- ***Read and understand doctrine.*** It may not always fit your organization, but if you understand how the Army operates and how your unit fits into the greater picture, you will be better equipped to adapt to the conditions in which your unit is operating.
- ***See yourself as the commander's asset.*** You are part of the commander's staff; or if not, you should be. Warrant officers provide counsel and input to all stages of training, mission planning, and operations. So, be engaged with staff operations so that you can provide advice early on.
- ***Know your tradecraft.*** You should also learn about the tradecraft of the other Army professionals whom you serve with so that you will be better able to apply your skills in supporting them.
- ***Seek broadening assignments.*** These assignments will challenge you, expand your frame of reference of the Total Army, and potentially position you to compete for positions like the ARSTAF SWO.
- ***Engage with the Engineer School and the Engineer Regiment.*** Find out what the Engineer School is working on, and provide your observations. And when the U.S. Army Human Resources Command calls on you to serve at the schoolhouse, jump at that chance. There is no better way to impact the whole Army than by bringing what you've learned in the field to the institution.

Until we meet again, stay safe.

Essayons!

("Clear the Way," continued from page 2)

I am pleased to announce that the Regimental Resource Library is now up and running on the ESKN Web site. This is a 21st century version of the old Commandant's Reading List. I encourage you to visit the site, register, and start participating and sharing in our professional engineer forum.

Finally, we discussed the Army strategy as we move toward Force 2025. We plan to continue this collaborative thought process after the SELC to tackle the task of shaping the Regiment for the future and taking advantage of every opportunity to make it the best. The projected future will include an austere budget that will force us to more wisely manage our personnel and resources in a cost-effective manner. I believe that we all own "stock" in our Army and in the Engineer Regiment. All of us contribute to the value of national security. This means that pooling our intellectual resources and sharing our best ideas has to be a high priority to maintain and increase our value to our Nation. I hope that you engage in the discussion via milSuite, ESKN, e-mail, or telephone calls. We are always looking for more opportunities!

Army Strong—Engineer Strong—Essayons!

TRIBAL KNOWLEDGE:

What You Don't Know About Promotion Boards Can Hurt You

By Colonel Adam S. Roth

I served as a board member on the Reserve Component Army Promotion List captain board, 3–12 December 2013 at Fort Knox, Kentucky. Board caveats precluded me from publishing this article until now. It is intended to provide senior leaders and "tribal elders" the impressions of one senior officer, describe the work that must be done to ensure the propagation of our species (engineer company grade officers), and point out where we must improve our mentoring to ensure success. I also want to provide this information to the next generation of Engineer Regiment leaders and give them the tools they will need to survive to become tribal elders.

Board Process

Board members were carefully selected by the Department of the Army (DA), representing branch, gender, and racial demographics. Members are considered to represent the best in their field, and it is an honor and privilege to serve on the board. Senior members of the readership who have not taken advantage of the chance to serve should consider doing so. Each member is sworn by oath and briefed on board procedures and the way to develop the word picture that comprises the selected candidate. This was a fully qualified board (as opposed to a best-qualified board due to the shortage of captains in the Army National Guard and U.S. Army Reserve). Officers deemed fully qualified would possess at least a moral and ethical grounding, an officer basic leader course, a bachelor's degree, and Officer Evaluation Reports (OERs).[1] Officers were selected because they satisfied the criteria in the fully qualified word picture, nonselected because of one or more missing items, or nonselected for show cause because of derogatory information, ranging from multiple failed Army physical fitness tests (APFTs) to a general officer memorandum of reprimand. Board members had their own ways of assessing files from a mechanical perspective, but the word picture drove the selection or nonselection.

Army Selection Board System

The U.S. Army Human Resources Command provides an automated system to board members. It allows two-screen viewing: one screen displays the DA photograph as the first document to come up when a file is opened; the other side usually has an officer record brief if one is in the file. Board members may have a target of reviewing 200–250 packets per day. The board on which I was a member ran nearly perfectly and reduced the time needed to maneuver through an officer's life to just 2–4 minutes. Once a rhythm is established, the software system works very well. It was apparent that numerous board after action review comments led to this software working as well as it did.

Discriminators and Mixed Strategic Messages

The single greatest discriminator of the board was the civilian educational qualification (CEQ). Numerous officers who were otherwise qualified and had distinguished service records were nonselected due to the CEQ. Many Regular Army officers who were transitioning to the Reserve Component had an obvious CEQ (assuming that they entered active duty through a formal, 4-year commissioning source), but did not have proof of their qualification in their new U.S. Army Reserve official military personnel file and were nonselected. If the Reserve Component is to grow their own future leaders while simultaneously attracting the numerous combat-proven leaders who are separating from the Regular Army, Reserve Component leaders must clarify the message they are sending and begin setting those young officers up for success.

File Trends

With almost every file containing a DA photograph and an officer record brief, the Army National Guard had a better overall showing of complete files. The U.S. Army Reserve files were disappointing, since most lacked a DA photo, officer record brief (not a requirement but an item that makes things enormously easier for board members), or DA Form 2-1, *Personnel Qualification Record*, which is an antiquated but useful form that helps a board member make decisions.[2] Even files that made poor first impressions received due consideration, but the considered officers had already sent a message that they did not know what was expected in a board file (information easily found in the related U.S. Army Military Personnel Center message announcing the board). Another message was that senior leaders are not taking the time to show young officers key tribal knowledge about how to prepare for boards and to realize that they must serve as their own best career

"The single greatest discriminator of the board was the civilian educational qualification (CEQ). Numerous officers who were otherwise qualified and had distinguished service records were nonselected due to the CEQ."

managers. The following are observations about specific items in the files:

- ***Sending Mixed Messages With OERs.*** The quality of OERs for the company grade officers being reviewed was disappointing across the Army National Guard and U.S. Army Reserve. Senior raters frequently rated their officer as above center of mass, but then included comments such as *promote with peers*, which sends a mixed message. The tribal knowledge of having the big four—enumeration, potential for promotion, potential for schooling, and potential for command—in a senior rating was evidently not being passed along. Senior raters blew their chance to make a stand-out evaluation and sent a mixed message. If this had been a best-qualified board instead of a fully qualified board, this message would have taken an extreme toll on the selected population.

  A frequent first comment by a senior rater was *concur with rater*. This is duplicative at best and indicates that some units have a culture of writing this comment because they "have always written them this way." Numerous senior raters also neglected to mention the word *promote* in their comments, leaving the board member to guess whether this was an act of omission or commission. The maxim that raters write for counseling and senior raters write to the board and to promote holds true. The rated officer is the principal reader of the rater comments, which serve as counseling. The senior rater comments are closely read by the promotion board, even though board members see the rater comments too. If a senior rater places an officer below center of mass–retain or below center of mass–do not promote, board members considered that officer either for nonselection or for show cause. This was based not only on derogatory information, but also on the rated officer's inability to execute duties in a satisfactory manner. The board reads such comments and will act accordingly.
- ***Forcing the Board to Act.*** Frequently, officers had failed to pass two or more APFTs or to meet height and weight standards. Sometimes, raters or senior raters included comments about attempts to complete remedial programs. However, the message was clear that they wanted the board to initiate a show-cause action, rather than have the unit act as the "bad guy."
- ***Promoting the Captains Career Course Culture.*** Certain branches, especially the infantry, expect their officers to attend and graduate from the captains career course before promotion to captain or assumption of company command. Tribally, the Engineer Regiment is nowhere near this goal. We still have captains (in the Active Guard Reserve) waiting 3–4 years into their captaincy to attend the course. In troop program units, it is promotion peril, rather than desire to prepare for company command, that frequently drives many captains to attend the course. This is an issue for the Engineer Regiment and the U.S. Army Engineer School (as it relates to structure and manning decision review and slot allocation) that should argue for the expansion of Engineer Captains Career Course slots for the Reserve Component.
- ***Improving DA Photographs.*** Official photographs ran the gamut from professionally done, showing officers in Army service uniforms with all awards in the correct order of military precedence to blurry, amateurish shots of subjects in officer greens with enlisted service stripes and ribbons placed according to what colors matched. Some records even contained enlisted photographs. Many officers wore smiles, many displayed poor body positions, and some even had moustaches. The DA photograph is the first impression the board gets, and as long as there is a DA Photograph Management Information System facility, the photographs should be consistent. Also, officers should have their platoon sergeants look over their uniforms to ensure that they are making the right first impression.

  Some records contained comments about the officer's inability to get a DA photograph because of last year's government shutdown or because the officer deployed to a location that lacked proper facilities. One suggestion is that when units conduct battle assembly or extended combat training on a Regular Army installation, officers make obtaining a DA photograph one of their training objectives.
- ***Meeting the CEQ.*** Commissioned officers must hold a bachelor's degree by the time they are promoted to captain. This sounds simple, but a significant percentage of officers reviewed either stopped after they acquired an associate's degree or accumulated 120 credit hours (an Army National Guard requirement), but never completed their degree. Trend analysis should be performed to see how many of these officers had direct commissions or attended officer candidate school and to establish what they knew about the educational requirements for promotion. Many of the records of combat-proven leaders had comments from raters and senior raters about the need to get college degrees, but others had no such comments because the rated officers had never shared their files with their raters or senior raters as part of a comprehensive performance counseling. Whenever possible, raters and senior raters need to personally examine an officer's file well before any board action.

- ***Determining the CEQ.*** The most time-consuming task for board members was determining civilian education. The board file in the Army Selection Board System may have a coding that the officer is civilian education-qualified, but the CEQ still must be verified. Board members were frequently seen craning their necks to read landscape transcripts in a vertical format in an effort to find anywhere on the transcript that it said "degree awarded" or "degree conferred." If the information is not readily apparent, some board members may simply move on. The presence of a diploma in the file is perhaps the best solution, but something as simple as a circle around the qualification information could save valuable time on a file and improve the chances of selection.
- ***Improving Knowledge of Board Requirements.*** I found it terrifying that numerous Adjutant General (AG) Corps officers had poorly maintained files. The board recorder, a field grade AG officer, said that members of his branch spent most of their time on U.S. Army Human Resources Command systems rather than learning how to prepare official military personnel files. AG tribal knowledge is poor, and leaders there need to influence what is being taught at their branch basic officer leader course and show their junior officers what constitutes basic tribal standards.
- ***Including Letters to the Board President.*** Perhaps 10 to 15 percent of the packets I reviewed provided this correspondence. Frequently it centered on the officer's inability to get a DA photograph during the government shutdown. Occasionally, the letter concerned an OER that was missing or had been submitted late. Letters to the president of the board are still a means to communicate what a personnel file cannot.
- ***Including APFT Data.*** Records that included failed APFTs usually had comments from the rater or senior rater, often explaining that the officer was in a deployed environment where a test was impossible. But there also were OERs that had blank spaces with no explanation. Apparently, there are still many officers who believe that an APFT is optional or does not apply to them. Raters and senior raters must continue to demand a copy of the APFT Scorecard, along with the OER Support Form from the rated officer as the file makes its way from rater to senior rater.[3, 4] If these items are missing, appropriate counseling must be performed.
- ***Including an OER Support Form.*** Many senior raters made use of the block that states whether or not they received a support form. During a best-qualified board, those without a support form would be the first officers to get downgraded in scoring. Including the form should become a habit in the Reserve Component, starting with leaders.
- ***Proofreading.*** There were frequent examples of mistakes such as "promote with pears," especially in senior rater comments. Such errors show a lack of due diligence in the rating chain and degrade the credibility of all involved. Word processing software has a spell check function—ratees and raters need to learn how to use it. During a best-qualified board, typographical errors could cost points.

Some Thoughts on a Way Ahead

The preparation for a promotion board is solely the responsibility of the officer being considered. It is incumbent on leaders to engage with that population well before any board and to include reminders of that responsibility in regular counseling. Counseling should include a file review and a determination of when an officer is in above-zone, below-zone, or primary-zone consideration. There must be a partnership between the considered officer, the chain of command, the U.S. Army Human Resources Command (for Active Guard Reserve and Individual Mobilization Augmentees), and the Army Reserve Careers Division (for troop program unit officers). Records should be scrubbed with the rated officer and his or her chain of command, complemented by a representative of the U.S. Army Human Resources Command or the Army Reserve Careers Division.

Reserve Component leaders reaching out to Regular Army officers under consideration should inform them early about selection board expectations and ensure that they are set up for success. It might be that simple act of kindness that gets an officer hooked on the Reserve Component for the remainder of his or her career. Leaders should spread this information to anyone who could benefit from it and should strongly consider seizing this unique opportunity to make a difference. Make no mistake, an officer being nonselected for a fully qualified board is inexcusable, except in cases where the officer should be separated. We leaders have much work to do in changing a culture of entitlement into one of merit, transferring tribal knowledge, and tying our assisting agencies into this process. If we senior leaders fail, we will have failed in our key role of propagating the species. As always, the author welcomes vociferous debate and can be reached at <adam.roth@us.army.mil>.

Endnotes:

[1]DA Form 67-10-1, *Company Grade Plate Officer Evaluation Report*, March 2014.

[2]DA Form 2-1, *Personnel Qualification Record*, March 2008.

[3]DA Form 705, *Army Physical Fitness Test Scorecard*, May 2010.

[4]DA Form 67-10-1A, *Officer Evaluation Report Support Form*, March 2014.

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Employment of Brigade and Task Force Engineers: Part 1

By Colonel Jason L. Smallfield

The creation of 32 engineer battalions in the Regular Army over the next 2 years and 28 engineer battalions in the Army National Guard over the next 4 years will give maneuver commanders additional organic engineer capability that they have not recently possessed. Leveraging this capability will require maximizing a resource that maneuver commanders have not had readily available recently: a task force engineer. Even more than this, an engineer battalion commander with lettered subordinate companies in the brigade combat team (BCT) is a muscle that neither the Army nor the Engineer Regiment has exercised in several years. The purpose of this article is to articulate what has changed for the engineer commander in terms of engineer capability over the last 30 years using a doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) framework and to describe what this means for the engineer commander. The second part of the article, to appear in the next issue of *Engineer*, will delineate some tactics, techniques, and procedures (TTP) that result from this analysis.

Before beginning the DOTMLPF analysis, the following terms must be defined:

- ***Task force.*** A temporary grouping of units, under one commander, designed to accomplish a particular mission.[1] In the U.S. Army, a task force is usually a battalion-size, ad hoc unit formed by attaching smaller elements of other units.
- ***Company team.*** A company-size unit with an armored or mechanized infantry unit attached. (A similar unit at the brigade level is a BCT.)
- ***Task organization.*** The design of an operating force, support staff, or sustainment package of specific size and composition to meet a unique task or mission.[2]

Doctrine

AirLand Battle was the conceptual framework that formed the basis of the Army's doctrine from 1982 into the late 1990s, replacing the 1976 active defense doctrine. (See Figure 1) AirLand Battle emphasized close coordination between land forces, acting as an aggressive maneuvering force with air forces attacking the rear-echelon forces that supply frontline enemy forces. It emphasized close coordination between land forces acting as an aggressively maneuvering force and air forces attacking the rear-echelon forces that supply frontline enemy forces. AirLand Battle was subsequently replaced in 1993 with a doctrine that emphasized major combat operations and military operations other than war. In 2008, Field Manual (FM) 3-0, *Operations*, emphasized that conflict involved more than combat between armed opponents.[3] Full spectrum operations applied combat power through simultaneous and continuous combinations of four elements: offense, defense, stability, and the defense support of civil authorities.[4] Army Doctrine Publication (ADP) 3-0, *Unified Land Operations*, superseded FM 3-0 in October 2011 and introduced the Army's new operational concept: unified land operations.[5] ADP 3-0 defines unified land operations as the way the Army seizes, retains, and exploits the initiative to gain and maintain a position of relative advantage in sustained land operations. It accomplishes this through simultaneous offensive, defensive, and stability operations

1976–1982	1982–1993	1993–2008	2008–2011	2011–Present
Active Defense	AirLand Battle	Major Combat Operations/ Military Operations Other Than War	Full Spectrum Operations	Unified Land Operations

Figure 1. Army Doctrine Since 1976

to prevent or deter conflict, prevail in war, and create the conditions for favorable conflict resolution.[6] The engineer capabilities to support this doctrine are combat engineering, general engineering, and geospatial engineering. The lines of engineer support include—

- Assure mobility.
- Enhance protection.
- Enable force projection and logistics.
- Build partner capability and develop infrastructure.

Finally, the reason engineers exist is to support unified land operations via decisive action in the performance of offensive, defensive, stability, and defense support of civil authorities tasks.[7] Doctrine in the last 30 years has evolved to reflect the simultaneous complexity of the modern battlefield, such as non-nation-state actors, conventional and nonconventional forces, and nonlinear and noncontiguous areas of operation.

". . . the reason engineers exist is to support unified land operations via decisive action in the performance of offensive, defensive, stability, and defense support of civil authorities tasks."

Organization

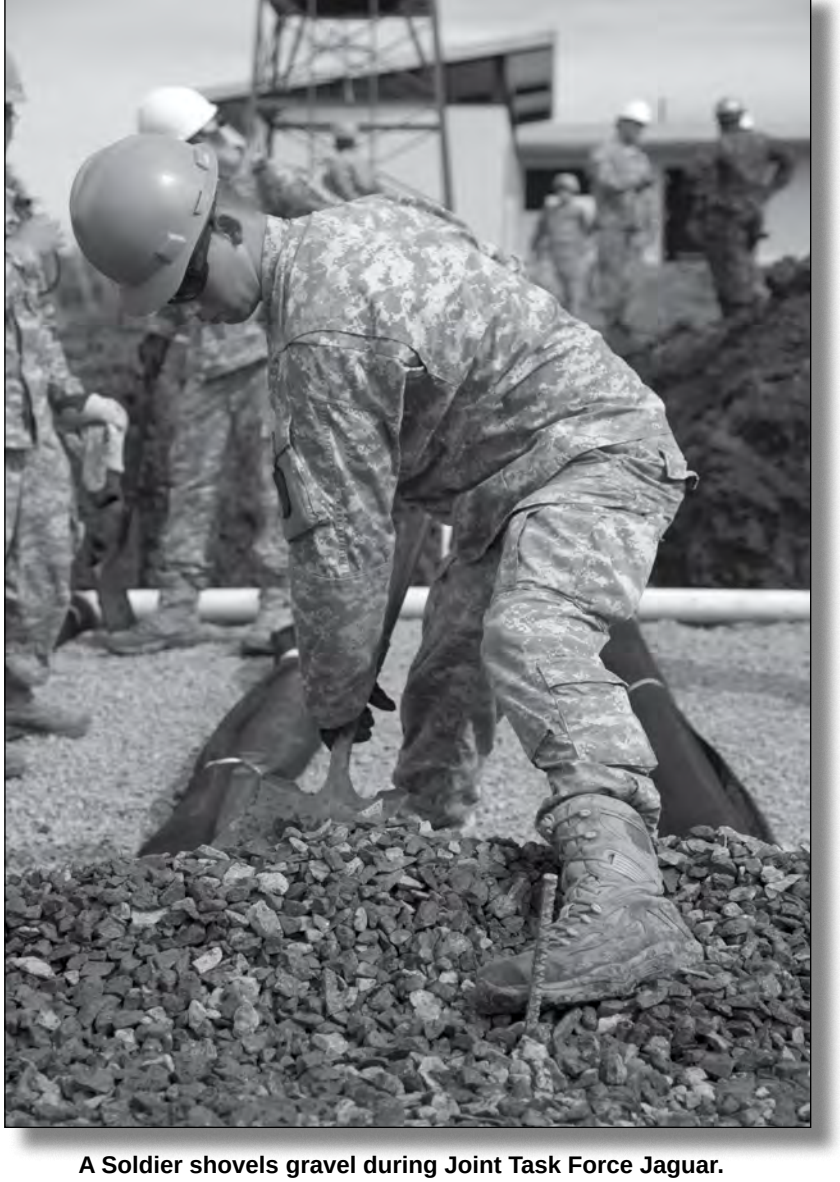
In March 1991, the Chief of Staff of the Army (CSA) approved the Engineer Restructuring Initiative (ERI) for implementation across the Army. The concept called for three divisional battalions under the mission command of a divisional engineer brigade commander within heavy divisions. While assigned to the divisional engineer brigade, the subordinate engineer battalions maintained a habitual support relationship with one of the division's combat brigades. A continuing movement to reduce the manpower of the Army and the application of scarce resources to other programs, such as modernization, prompted a number of engineer unit inactivations. In addition, the reorientation of the Army from a forward-deployed force to a continental U.S.-based force placed a premium on the ability to deploy quickly to a distant region. As in the past, the ability to meet certain deployment criteria sometimes became more important than the ability to perform required missions and tasks in the area of operations.

The Army transformation, which began in 2003, was a modernization plan to move the Army from its Cold War divisional orientation to a full spectrum capability with fully manned, equipped, and trained brigades.[8] This was the most comprehensive reorganization since World War II and included modular brigades and a rebalancing of the Regular Army and Reserve Components. This transformation changed the Army from mostly mechanized divisions of around 15,000 Soldiers to modular brigades of 3,000 to 4,000 Soldiers, with the aim of being able to deploy into different parts of the world. It effectively organized the Army closer to the way it fought.[9] The engineer portion of transformation created specific modular engineer formations such as clearance, mobility augmentation, sapper, and horizontal and vertical construction companies organized under a common engineer battalion headquarters design. Transformation reduced organic engineer capability within a BCT, which ranged from a sole engineer company under the special troops battalion for the infantry BCT to combat engineer companies (Echo companies) in the heavy BCT combined arms battalions. Engineer planning and mission command in the BCT experienced the biggest reduction, with only a small engineer staff section remaining in the BCT headquarters. The one engineer highlight of this formation was the creation of the five-person geospatial cell as part of the BCT headquarters.

In 2009 and 2010, the Engineer Regiment developed the brigade engineer battalion (BEB) initiative. This force design update was designed to support the two maneuver battalions in the BCT. By the time the BEB was approved, however, the Army decided to increase the BCTs by adding a third maneuver battalion. The BEB did not include a third engineer company for two critical reasons. First, there was not enough echelon-above-brigade (EAB) force structure to pay the bill; and second, the CSA limited the size of the BCT. The engineer battalion assigned to each BCT will provide increased engineer capability with two companies, but will have limited capacity to support the third maneuver battalion. Additional engineer capacity and capability (such as defensive operations, engagement area development, offensive operations, lodgment expansion, stability operations, partner capacity building, defense support of civil authorities, port construction and repair, and mission command headquarters) for these EAB enablers will need to be anticipated, requested, and allocated for home station training, training center rotations, and support to contingency operations.

The bulk of engineer force structure now resides in the Reserve Component, with 19 percent in the Regular Army, 50 percent in the Army National Guard, and 31 percent in the U.S. Army Reserve. Upon completion of active BEB conversion in fiscal year 2015, the Regular Army force will be 48 percent BEB and 52 percent EAB. While table of organization and equipment organizations are generally designed to meet Phase III requirements to dominate the enemy, the strategic impact of this force mix demands recurrent, assured, and predictable access to Army National Guard and U.S. Army Reserve units through all phases of the operation (shape the environment, deter the enemy, seize the initiative, dominate the enemy, stabilize the environment, and enable civil authority).[10]

Three engineer organizational trends derive from the above. First, the division-centric Army has been reshaped to a BCT-centric force and will remain the key building block for the Army moving forward.[11] Second, maneuver brigade commanders have clamored for more engineers during combat operations and this need has often been forgotten when inactivations and reduced budgets have reduced Army strength and engineer force structure.[12] Finally, engineer planners have generally based their organizational structures on the nature and quantity of work to be done in a given area, while Army planners have been influenced by the dictates of deployability and unique operational requirements forcing in-lieu-of solutions to meet global demands. This trend resulted in EAB engineer organizations that were not available or optimized to augment BCT formations.[13] As we build the Army of 2020, the Engineer Regiment will reshape and optimize the remaining EAB force structure. For example, the construction force design update is under evaluation at Headquarters, Department of the Army. This update will correct some of the overmodularization in the force and ensure that all construction companies have vertical, horizontal, and survey design capabilities. The goal will be the creation of multifunctional combat and construction units, designed to augment the BEB and BCT while ensuring the flexibility to support unified land operations in the division and corps areas.



A Soldier shovels gravel during Joint Task Force Jaguar.

Training

Readiness in the 1990s was based on a tiered readiness system with some units kept at higher manning, maintenance, and training standards than other units. These units included XVIII Airborne Corps and subordinate units (such as 82d Airborne Division and 24th Infantry Division), while units at lower readiness levels included I Corps, III Corps, and their subordinate units (such as 1st Armored Division and 1st Infantry Division). This readiness system was predictable and kept all units at a stable level of readiness (although it reflected haves and have-nots within the force structure). The Army force generation model was approved by the Secretary of the Army and CSA in 2006.[14] It was the Army process for meeting combatant commander requirements by synchronizing the building of trained and ready units.[15] The underlying idea was to tap into the total strength of the Army, leveraging Regular Army and Reserve Component units, while sustaining the process by employing a rotational, predictable deployment plan.[16] This placed units on a tiered readiness duty roster and rotated units through high readiness as they prepared to deploy. This was necessary to meet wartime requirements but led to vast swings as units went from the trained/ready pool into RESET. Enablers such as EAB engineers were forced to operate at a higher operational tempo than the supported BCT forces and were typically out of cycle with the units they would support in combat. In addition, the focus of engineer training in the 1990s was on the broad spectrum of mobility/countermobility/survivability. This broad focus narrowed in the 2000s almost exclusively on explosive-hazard defeat. This has degraded other combat engineer skill sets.

Army regional alignment is the process that organizes and improves the Army's ability to provide regionally aligned forces to geographic combatant commanders. Regionally aligned forces support combatant commands, which include the six geographic combatant commands and the three functional combatant commands. They provide predictable access to mission-tailored, regionally trained, and culturally aware forces who respond to all requirements, including operational missions, bilateral and multilateral military exercises, and theater security cooperation activities. Regional alignment provides focus and direction for unit training and preparation.[17]

Materiel

Much of the key materiel that was available within the ERI in the 1990s was rarely used in Iraq and Afghanistan. (See Table 1.) Currently, the primary engineer materiel includes some of what was used in Iraq and Afghanistan and some of the materiel used in the 1990s. The older materiel, however, was rarely operated during the War on Terrorism and will require significant repair parts, money, and resources to regain full operability. In addition, materiel in the BEB is largely an Army-wide redistribution. The BEB was designed with no personnel growth and minimal equipment growth to the Army. Because of this, there are some aspects of the BEB tables of organization and equipment that are suboptimal.

Leadership and Education

Leader development changes have been substantial and involve more than just name changes. (See Table 2.) Each of these courses is shorter and covers less functionally specific topics than their predecessors, resulting in a shift from institutional responsibility to operational responsibility and self-responsibility that have never been fully realized. Additionally, the CSA and the commander of U.S. Army Training and Doctrine Command have noted that the combat training centers historically have been the primary leader development training sites. The War on Terrorism, overseas contingency operations, and Army force generation requirements forced the Army to use the centers as "readiness factories" rather than for their intended purpose. Going forward, leader development will again revert to the combat training centers. Some task force engineer skills were once taught in the institutional force but are no longer. Some were once practiced in the operational force but are no longer. Also, opportunities for self-study for the task force engineer are less readily available than they once were.

The U.S. Army Engineer School has worked to mitigate this trend within the institutional force through several initiatives such as increasing the number of small-group leader exchanges with the Maneuver Center of Excellence, extending the Engineer Captains Career Course from 21 to 23 weeks, and reestablishing the combat training center/Engineer School linkage to cross-level information among these organizations.

Personnel

Personnel changes in the last 30 years have had minimal impact in terms of engineer personnel and the capability they bring to a BCT. Most of the changes have involved military occupational specialty (MOS) number changes to facilitate understanding and consolidation. In the warrant officer ranks, for example, MOS 210A, utilities operation and maintenance technician, changed to MOS 120A, construction engineering technician. MOS 215D, terrain analysis technician, changed to MOS 125D, geospatial engineering technician. In the enlisted general construction ranks, MOS changes included construction equipment operators, surveyors, quarry specialists, plumbers, and vertical construction engineers. Two of the most substantial changes involved geospatial engineers and component mix. Changes were made for geospatial engineers to leverage the quantum leaps in technology in this area. Geospatial engineers have changed from MOS 81Q, terrain analyst; 81C, cartographer; and 81L, lithographer, to the current consolidated MOS 12Y, geospatial engineer. In addition, the

1990s ERI Equipment	War on Terrorism Equipment
Armored vehicle-launched bridge	RG31 mine-resistant, ambush-protected vehicle
Combat engineer vehicle*	Buffalo mine-protected clearance vehicle
Wolverine heavy assault bridge	Husky mounted detection system
Armored personnel carrier	Up-armored, high-mobility, multipurpose, wheeled vehicle
Bradley fighting vehicle	
Armored combat earthmover	
Small emplacement excavator*	
Deployable universal combat earthmover	
Mine-clearing line charge	
Volcano mine dispenser	
Modular pack mine system	
High-mobility, multipurpose, wheeled vehicle	

Legend:
ERI – Engineer Restructuring Initiative
*No longer in inventory

Table 1. Engineer Equipment Changes

Old	New
Primary Leader Development Course	Warrior Leader Course
Basic Noncommissioned Officer Course	Advanced Leader Course
Advanced Noncommissioned Officer Course	Senior Leader Course
Engineer Officer Basic Course	Engineer Basic Officer Leader Course
Engineer Officer Advanced Course	Engineer Captains Career Course
Command and General Staff College	Intermediate-Level Education

Table 2. Changes to Leader Development Courses

Engineer School has partnered with the Intelligence Center of Excellence to form geospatial intelligence cells with imagery analysts and geospatial engineers at the BCT, division, and corps headquarters levels. The Engineer Regiment now consists of 17 enlisted MOSs, two warrant officer MOSs, and three commissioned officer areas of concentration.

The other substantial change has been the migration of much of the Engineer Regiment from the Regular Army to the Reserve Component. Some specialties, such as quarrying specialist, are entirely in the Reserve Component, while the prime power production specialty resides exclusively in the U.S. Army Corps of Engineers.

Facilities

Engineers in the 1990s were organized into engineer battalions and brigades, which were consolidated in facilities such as brigade and battalion headquarters, company operating facilities, motor pools, and barracks. This consolidation facilitated vertical and horizontal information sharing. Transformation from 2004 to 2008, however, separated engineer formations organizationally and in terms of facilities. This separation inhibited engineer cross talk and information sharing. The creation of BEBs in BCTs will help integrate the engineer battalion with its subordinate lettered companies, assuming that installation commanders work to colocate these formations.

Conclusion

This is the first of a two-part article. The second part, which will appear in the September–December 2014 issue of *Engineer*, will delineate specific, recommended TTP for the employment of brigade and task force engineers. Understanding the DOTMLPF changes that have occurred in the past 30 years, however, is essential to putting the recommended TTP into the proper context and will enhance their applicability in the field by the operational force.

Endnotes:

[1]FM 3-21.20 *The Infantry Battalion*, 13 December 2006.

[2]Army Doctrine Reference Publication (ADRP) 3-0, *Unified Land Operations*, 16 May 2012.

[3]FM 3-0, *Operations*, 2 February 2008. (Superseded by ADP 3-0)

[4]Ibid.

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

[6]Ibid.

[7]ADRP 3-0, 2012.

[8]William M. Donnelly, *Transforming an Army at War: Designing the Modular Force, 1991–2005*, Center of Military History, Washington, D.C., 2007.

[9]Ibid.

[10]Joint Publication 5-0, *Joint Operation Planning*, 11 August 2011.

[11]Vincent Hodge, "Evolution of The Engineer Force," unpublished article, U.S. Army Engineer School, 18 March 2003.

[12]Ibid.

[13]Ibid.

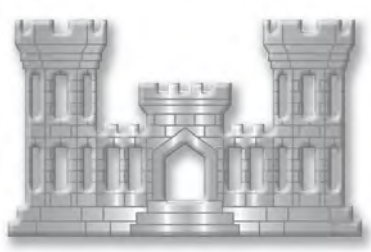
[14]Staff Sergeant Alexandra Hemmerly-Brown, "ARFORGEN: Army's deployment cycle aims for predictability," 19 November 2009, <http://www.army.mil/article/30668/>, accessed on 8 December 2013.

[15]Ibid.

[16]Ibid.

[17]David Vergun, "Regionally aligned forces continue to organize despite budget uncertainties," 23 October 2013, <http://www.army.mil/article/113660/>, accessed on 8 December 2013.

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 and a certified facility manager.



MISSION COMMAND

AND THE BRIGADE HEADQUARTERS COMPANY

By Colonel Blace C. Albert

Since the Army began transforming to brigade combat teams (BCTs), brigades have created different business rules for their headquarters company. The question has never been whether the Soldiers in this company require leadership, resourcing, and supervision. The question is which organization should provide those things. Some believe that this company should remain as a separate, subordinate organization in the BCT. On the other end of the spectrum, some would argue that the company should be attached to the brigade special troops battalion (BSTB), with the BSTB leaders assuming complete ownership as they do for their other companies. The compromise is that an operation order or a memorandum of agreement outlines what responsibilities and authorities the BSTB has. As the Army undergoes another transformation from BSTBs to brigade engineer battalions (BEBs), the question of how to exercise mission command with respect to the brigade headquarters company remains relevant. This article will make the case that the company should be attached to the BEB and that the battalion should assume 100 percent responsibility for the organization. This increases the ability of the BCT to accomplish its mission, which is what we are all trying to achieve.

The headquarters company requires supervision like every other company in the Army. There are numerous tasks that Soldiers must complete each week. Some of these are directed, such as the requirement that everyone using e-mail complete their information assurance training. Some of the tasks are created at the battalion level, based on the experience of the commander and staff. For example, after 2 months on a recent deployment, everyone was required to update their emergency data and life insurance.[1, 2]

Opponents of attaching the headquarters company to the BEB say that such supervision is the responsibility of the company commander and first sergeant. That is partially true, but all companies need items to be reinforced or prioritized, and a company commander and first sergeant do not have the same depth of experience as a battalion commander and command sergeant major. Table 1 shows numerous things that the BEB can ensure are accomplished by headquarters company Soldiers. Many of these things require mature proofreading, guidance, and input to the content, all of which a battalion commander and a battalion staff can provide.

The company has resourcing requirements just like the other 29–37 companies in the brigade. Soldiers in the headquarters company must qualify on their weapons, complete training for a valid military driver's license, undergo annual drownproofing, train on warrior tasks and battle drills, attend numerous schools, and satisfy many other requirements. Resourcing the ammunition, ranges, motor pool, vehicles, field rations, and training areas is the responsibility of a battalion staff; and the BEB can do this for the headquarters company. Who will do this if the company does not work for the battalion? The company commander is not staffed to accomplish this on his own, and the brigade staff is busy enough without having the responsibility of caring for an extra company in addition to six or seven battalions. Headquarters company representatives should attend BEB training meetings, resource conferences, and executive officer meetings. The battalion commander can approve the

Apply Global Assessment Tool 2.0.[1]	Conduct Congressional investigations.
Apply U.S. Army Forces Command Soldier Risk Assessment Tool.[2]	Conduct field grade Uniform Code of Military Justice actions.
Conduct information assurance training.	Distribute command information.
Update emergency data records.	Audit family readiness group accounts.
Submit timely award recommendations.	Maintain unit status reports.
Process timely evaluations.	Process Financial Liability Investigation of Property Loss.[3]
Report serious incidents.	Maintain security clearances.
Report accidents.	Record flags and bars to reenlistment.
Conduct incident/accident review boards.	Inspect privately-owned vehicles.

Notes:

[1]Comprehensive Soldier and Family Fitness, "Take the GAT," <http://csf2.army.mil/takethegat.html>, accessed on 10 March 2014.

[2]"FORSCOM Soldier Risk Tool (Version 2, May 11)," <http://www.google.com/url?sa=t&rct=j&q =&esrc=s&frm=1&source=web&cd=1&cad=rja&uact=8&ved=0CCUQFjAA&url=http%3A%2F%2Fwww.campbell.army.mil%2Funits%2FCommandGroup%2FDocuments%2FTraining%2520or%2520Leader%2520Development%2FFORSCOM_Soldier_Risk_Assessment_Tool_97_03.xls&ei=jwEeUbJGub00gGgwICICg&usg=AFQjCNHXhm8bFEkQ3S_ggVLn-otGpNc4lQ>, accessed on 4 April 2014.

[3]Department of Defense Form 200, *Financial Liability Investigation of Property Loss*, October 1999.

Table 1. Company Tasks Supervised by a Battalion

company training schedules. These are duties that a busy brigade executive officer or operations officer (S-3) would gladly let someone else assume so that they can focus on responsibilities across the battalions instead of managing an individual company.

Headquarters company leaders require battalion mentorship the same as any other company commander, executive officer, or first sergeant. In the past, the headquarters company was frequently commanded by an officer who had already commanded another company. Today, the position is routinely filled by an officer who is commanding a company for the first time and frequently is not from a combat arms branch. These company level leaders need just as much mentorship as other BCT company command teams. This mentorship can come from the BEB commander, and it involves more than just signing Army Achievement Medal recommendations and other routine paperwork in an administrative control relationship. Again, the senior brigade staff officers are too busy to put sufficient effort into mentoring a young captain. Also, some business should remain in the troop-leading chain of command because it is the business of commanders, not staff officers. Examples include executing or supervising the Command Supply Discipline Program and approving risk assessments, leader professional development programs, command maintenance, promotions, unit commander financial reports, and unit status reports. Every other company commander has a battalion commander to conduct change-of-command ceremonies and perform ratings. Should the headquarters company commander be different? But if the BEB commander is going to rate the headquarters company commander, that captain should be attached and completely accountable to the battalion. Only with complete supervisory and mentoring responsibilities can the BEB commander provide the headquarters company commander with an honest, justified *Officer Evaluation Report*.[3]

Those who disagree with attaching the headquarters company to the BEB may argue that the company is designed to be a separate unit. However, the Army transformed and requires its leaders to be agile and able to accept change. Based on Stryker brigade after action reviews, transformed BCTs had a BSTB commander and staff to assume the leadership responsibilities for what had been the brigade's separate companies. Now, the Army is transforming again so that even the Stryker brigades will receive a new BEB. If the BEB performs the function of "unique company" integrator for the BCT military intelligence and signal companies and numerous other attachments, why can it not perform the same function for the BCT headquarters company?

The biggest objection from opponents of this task organization is that the brigade staff can be tasked by the battalion. For example, the brigade can tell the BEB to provide six Soldiers for a cleanup detail and the BEB can turn around and tell the headquarters company to provide one Soldier for the detail. There are two important points to make here. First, the brigade headquarters company has 175 Soldiers who can help accomplish brigade missions just like the other six or seven headquarters companies in the BCT. All Soldiers in the BCT are assigned for a reason, and all must assume a fair share of taskings. Second, the BEB S-3—usually a major with 12–15 years of experience who has already served on a brigade staff—can be trusted to determine the fair share of the headquarters company. It is common for key and essential personnel to be exempted from duty. This technique may be applied to help keep the BEB S-3 from inappropriately tasking the brigade. Coupled with communication between the majors working on the BEB and

Best battalion competitions	Battalion runs
Company commander lunches	First sergeant lunches
Officer physical training	Battalion sports day
Organizational day	Deployment yearbook
Birthday cards from battalion commander	Battalion closeout formations
Command maintenance formations	Payday award formations
Combat patch ceremonies	Leader breakfasts
Safety awards	Battalion commander congratulatory notes
Family readiness group leader recognition	Graduation event participation

Table 2. Morale-Building Events

brigade staffs, very few issues should arise in this unique relationship.

One of the headquarters company first sergeants I knew periodically suggested that things would work better if the company were not attached to the BSTB. I was always surprised by that opinion because of the many things the battalion did for the company, such as providing resources and briefing the headquarters company unit status report so that the company commander and first sergeant didn't have to do so. Ironically, that first sergeant was unknowingly asking to become less empowered. If the brigade leaders were tasking the headquarters company for a senior noncommissioned officer (NCO) directly, they would almost certainly say, "Use Sergeant First Class Smith for the funeral detail." However, if the brigade tasks the BEB for a senior NCO for the funeral detail, the BEB will simply task the company for the name of a senior NCO. Now the first sergeant is empowered, because he can meet with brigade senior NCOs to discuss which NCO they should use for the detail.

Finally, attaching the headquarters company to the BEB is good for Soldier morale. Leaders should provide inspiration, keep their subordinates informed and motivated, and create an environment where Soldiers want to come to work and feel proud of their accomplishments. Everyone wants to feel that they are a part of something bigger than themselves. But how many brigade staffs accomplish this? Most of the leaders I've known in headquarters companies are merely "rowing to serve the ship," working as hard as they can so that they can be home by 1900 and not have to come into the office over the weekend. Table 2 is a list of events that Soldiers in the headquarters company participated in when they were attached to the BSTB.

The majors and senior NCOs on the brigade staff may not care much about these events, but Soldiers do. Participating in a day of sports or hanging out with their Families at an organizational day is good for Soldier morale. Being included in combat patch ceremonies or having their own company pictures in a yearbook that documented their deployment makes Soldiers proud. Staying informed by hearing senior leaders speak at formations or lunches increases the level of job satisfaction for Soldiers. The bottom line is that battalion functions are important for Soldier morale and provide one more reason why the headquarters company should be attached to the BEB.

The intent of this article is to convince Army leaders that the best relationship for the headquarters company is to be attached to the BEB. No battalion commander wants to receive a mission such as caring for a company and then be given mere administrative control instead of full authority to accomplish it. Centrally selected battalion commanders and experienced majors within a BEB are smart enough to appropriately task a headquarters company while taking care of the company and its Soldiers. The brigade and battalion executive officers and S-3s are certainly mature enough to maintain good communications as they refine roles and responsibilities in this unique relationship. When the company works for the battalion, the workload of the company command team is greatly reduced and busy senior brigade staff officers are not burdened with managing a separate company, much less providing command oversight that is not their responsibility. This means that the BCT has increased its ability to accomplish the mission by building a cohesive team through mutual trust, accepting prudent risk, and facilitating disciplined initiative. I would advise those brigade commanders, BEB commanders, headquarters company commanders and first sergeants, operations sergeants major, and anyone else who is still not convinced of this to try it. I'm sure they will discover that the benefits gained from a pure attachment far outweigh the burden of having the BEB task the brigade staff for someone to be on a post cleanup detail every once in awhile.

Endnotes:

[1]Department of Defense (DD) Form 93, *Record of Emergency Data*, January 2008.

[2]SGLV 8286, *Servicemembers' Group Life Insurance Election and Certificate*.

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

In August, Colonel Albert departs the U.S. Army Peacekeeping and Stability Operations Institute at the U.S. Army War College, Carlisle, Pennsylvania, to take command of the 130th Engineer Brigade in Hawaii. In addition to almost 3 years as commander of a BSTB, he was S-3 for 15 months and deputy commander for 6 months in an infantry BCT. He holds a bachelor's degree in aerospace engineering from the U.S. Military Academy and graduate degrees in engineering management from the University of Missouri–Rolla (now Missouri University of Science and Technology), mechanical engineering from the Georgia Institute of Technology, and strategic studies from the U.S. Army War College. He is a licensed professional engineer in Virginia.

Redefining Route Clearance For Future Operations

By Captain James B. Weakley and Captain Eric P. Ng

America's current and potential adversaries have learned several lessons from watching more than 10 years of conflict in Iraq and Afghanistan. One of these lessons involves attacking the overwhelming U.S. technological advantage with relatively simple, low-tech improvised explosive devices (IEDs) and other explosive hazards (EHs). Our enemies will use explosive devices during any foreseeable future conflict, and the U.S. Army can expect to conduct route clearance missions as a key enabling task to allow freedom of movement and maneuver for the combined arms team. Our current application of doctrine treats route clearance as a mission that is separate from combined arms breaching, but future military operations will require less distinction between them. Combined arms teams will be called on to apply the breaching fundamentals of suppress, obscure, secure, reduce, and assault repeatedly against EHs to get maneuver units to their objective with combat power intact. Route clearance should be defined as the detection and neutralization of EHs in support of a combined arms movement or maneuver to or from a specified objective.

Addressing the Definition of Route Clearance

Route clearance is typically understood to be a mission that is conducted to remove all obstacles along a given path so that friendly forces can travel safely. This definition does not imply that follow-on forces will maneuver along this route at a particular time or for a particular purpose. Route clearance, as often conducted in recent conflicts, is simply keeping a route open because the commander requires mobility along that route at some unspecified point with some unspecified force. This definition is problematic since it leaves room for interpretation. Furthermore, a clear route implies that all obstacles—to include IEDs and other EHs—have been completely removed.[1]

The current definition of route clearance requires revision since enabling friendly maneuver along a route implies that the route must be cleared and must remain under surveillance.[2] This definition is also overly broad, encompassing aspects of the counter-IED fight ranging from predictive analysis to forensic evidence exploitation. The definition of route clearance should be amended to read that the neutralization of IEDs, EHs, and other obstacles is conducted in direct support of a separate unit's movement or maneuver.

Defining the purpose of route clearance as the elimination of a threat along a route is at odds with reality, since practitioners from operations in Iraq and Afghanistan will agree that the elimination of IED and EH threats along any route

A mine-resistant, ambush-protected vehicle with mine rollers and a Husky mounted mine detection vehicle participate in route clearance operations in Khowst Province, Afghanistan.

A Husky mounted detection system performs route clearance.

is possible only for brief stretches of space and time. Because a location is only clear for as long as friendly forces keep it under observation after eliminating the threat, saying that the route is clear after a route clearance operation could be misleading. While one may assume that every maneuver commander intuitively understands the risk associated with the lapse of time after a route has been cleared, one must keep in mind that the maneuver commander receives information in a time-compressed environment. Designating a route clear or color-coding it to denote the extent to which a route is clear can oversimplify the tactical condition of a route in the absence of concise, shared definitions that tie risk to time lapse. Also, today's force has learned lessons from more than a decade of experience in Iraq and Afghanistan. Tomorrow's commander may have to face the EH threat without such experience. When conducted to clear, route clearance produces very narrow effects that are confined to a specific location for a limited time. For this reason, the definition of route clearance should be to neutralize obstacles along an assigned route to enable a supported unit to arrive at its objective with enough combat power intact to complete its mission.

Conducting route clearance on a regular basis with no supported unit maneuvering behind while synchronized with the clearance element does not produce a cleared route or provide the maneuver commander with improved mobility. A 2010 article in *Engineer* clearly demonstrates the point in the following excerpt:

RCPs [route clearance patrols] *clear routes in direct support of a BCT* [brigade combat team] *maneuver element conducting a mission. RCPs conducting missions that are not in support of a BCT maneuver element are not defeating the device, but simply putting RCP assets at risk. This argument is based on three assumptions:*

- *AAF* [Anti-Afghan Forces] *IEDs can damage or destroy RCP assets.*
- *AAF have more IED-making material and resources than U.S. and coalition forces have RCP assets within a BCT's area of operations.*
- *AAF can predict the routes U.S. and coalition forces use within a BCT's area of operations, thus giving the AAF the initiative.*

Once an RCP clears a route, the AAF simply return and reseed it with new IEDs.[3]

Predicting the Behavior of Future Adversaries

Critics may argue that those assumptions may not prove relevant in future conflicts. First, any critic believing that future adversaries will not be able to damage or destroy RCP assets should remember how rapidly our adversaries have adapted low-tech solutions to defeat even our most protected systems, not only in our current wars, but in previous fights as well. Second, IEDs are most commonly manufactured with relatively inexpensive, commercially available, dual-use technology. Homemade explosives are inexpensive and scalable, requiring a low level of technical expertise to produce. Explosive devices such as IEDs are likely to remain more common than RCPs in a future scenario, particularly as America continues to cut defense spending. Finally, those who say that poor

operations security, rather than terrain, is to blame for our adversaries' ability to predict RCP movements should remember that our future conflicts will be conducted among populations who can report RCP movements via modern commercial communications much quicker than slow-moving RCPs can reach their objectives. Simply put, future conflicts involving EHs are likely to adhere to the assumptions outlined in the 2010 *Engineer* article above.

An RCP may detect and reduce multiple EHs during a mission, but our adversaries of the last decade have demonstrated a remarkable ability to emplace additional EHs immediately after the RCP and other friendly elements quit observing a location. There is no reason to believe that future adversaries would behave differently. This means that the RCP should be in support of a maneuver or support element and function under operational control of that element. No other arrangement preserves the maneuver commander's combat power, because the route is no longer clear at the end of a route clearance mission and no supported unit has arrived at an objective with combat power intact. Route clearance should not be conducted as an end in itself. Because adversaries are likely to emplace new explosive devices as soon as an area is no longer observed by friendly forces, route clearance should only be conducted in coordination with, and in direct support of, another unit moving along the route.

Critics could argue that conducting route clearance solely in support of a dedicated maneuver unit would not protect the local populace. This point loses legitimacy when the nature of route clearance is considered. Route clearance is a slow, tedious process that often causes lengthy traffic jams when applied to heavily traveled civilian routes, frustrating the populace and disrupting host nation commerce. Damage to infrastructure will often occur during route clearance as explosive devices detonate on roads or bridges and slow-moving armored vehicles produce excessive strain on roads and bridges designed for civilian traffic. This adds to the frustration of the populace with U.S. forces and gives adversaries a propaganda advantage. The route clearance of civilian infrastructure involves an overt U.S. presence that delegitimizes host nation security forces. A better method for protecting the local populace from explosive device threats would be to help build or improve host nation counter-IED or route clearance capabilities.

The critics' second point could be that route clearance under these proposed definitions would limit contact with EHs to those found only on routes being traveled by U.S. forces. This would limit opportunities to collect evidence that could be used in the targeting cycle. However, evidence could still be collected during route clearance missions that support another unit's maneuver. Much as the breach force remains at the point of breach in order to pass the assault force and improve lanes in the obstacle during combined arms breaching activities, evidence can be collected by a stay-behind element of the route clearance unit if time is a concern. A more important consideration, however, is that our adversaries will probably place explosive devices only at locations where they can reliably target U.S. forces. The presence of U.S. forces to gather evidence would itself be a trigger for the adversary to emplace an explosive device, thereby compounding the threat to U.S. forces. Simply put, EHs sought out for evidence-gathering alone would risk route clearance assets for only marginal gain in the supported commander's freedom of movement and maneuver.

Conclusion

Future adversaries will continue to use improvised and manufactured explosive devices to disrupt U.S. forces and deny access to key areas throughout the operational area. Route clearance will continue to be a key mobility task in future conflicts. The RCP, as seen during more than 10 years of conflict in Iraq and Afghanistan, will more closely resemble a combined arms breach as hybrid threats seek to disrupt, fix, turn, or block U.S. forces with IEDs, other EHs, and terrain. Route clearance must be defined as the detection and reduction of IEDs and EHs in support of combined arms mobility to or from a specified objective. Conducting route clearance for a purpose other than enabling a supported unit to arrive at the objective with combat power intact commits precious mobility assets while achieving limited effects on terrain, enemy forces, and the local populace.

Endnotes:

[1]Army Tactics, Techniques, and Procedures 3-90.4, *Combined Arms Mobility Operations*, 10 August 2011.

[2]Ibid.

[3]Gerald S. Law, "Employing the Route Clearance Package in Afghanistan," *Engineer*, May–August 2010, pp. 47–49.

Editor's Note: Army Tactics, Techniques, and Procedures 3-90.4, *Combined Arms Mobility Operations*, 10 August 2011, is currently under revision and will be staffed for coordination this summer. Field Manual 3-34.210, *Explosive Hazards Operations*, 27 March 2007, will soon be superseded by two new publications: Army Techniques Publication 3-90.8, *Combined Arms Countermobility Operations*, and Army Techniques Publication 3-34.20, *Explosive-Hazard Operations*.

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Succeeding at "In Between" Assignments:

Serving as a Platoon Leader or Company Commander is Easy

By Lieutenant Colonel Paul J. Kremer

Platoon leader and company commander are the positions that stand as the traditional pinnacles of leadership assignments in which most officers will have the opportunity to serve. Consequently, the Army invests significant time and energy preparing officers for these positions, which makes those assignments easy. Battalion maintenance officer, assistant battalion operations officer, battalion supply officer, and small-group leader are only samples of the other duties that leaders may be assigned during their careers. Officers will have far more such non-key-and-developmental (non-KD) assignments than traditional ones. Ironically, most of lessons learned and even the Army Officer Education System focus more on the conventional assignments. This article will explore some techniques to find success while serving in those "in between" assignments while waiting to be assigned to a more traditional leadership position.

A platoon leader briefs Soldiers before conducting a presence patrol around a forward operating base in Afghanistan.

The first step upon notification of a non-KD team assignment is to conduct some research. In other words, do your homework. Since the non-KD team typically has little published doctrine, quality research is key. Searching for a field manual to provide tips on being a battalion personnel officer, a professor of military science, or a combat training center observer/controller will lead to a limited amount of information but little about the day-to-day business of those assignments. The scarcity of official doctrine does not mean that the position is not important; it simply means that the new officer has to work harder. The U.S. Army Center for Army Lessons Learned Web site at < http://usacac.army.mil /CAC2/call/> or the milSuite forums at <https://reg.milsuite .mil> are online places to find additional resources and information. Lastly, the newly assigned officer should remember that someone has already filled the role and should talk to the individual being replaced as a way to develop a good transition plan. It would be even better to communicate with several other officers who have held the job before or who are currently in that position in a similar unit. Learning from them will be far more valuable and current.

The second step is to develop the officer–noncommissioned officer (NCO) relationship. Undoubtedly, the new team will have an noncommissioned officer in charge (NCOIC). With experience gained as an Army leader, I understand how essential the senior NCOIC is to the success of any unit. While new officers must spend time learning the new and unusual organization they are now in charge of, they must also invest significant time learning about their NCOIC.

Junior officers learn a lot as platoon leaders and company commanders and should use what they learn in those assignments. Just as they worked to bond with their platoon sergeants, they should do the same with their new NCOIC. They might go to lunch together, perform physical training together, and talk about their families to get to know each other outside of their work environment. Learning as much as possible about each other will help maximize their strengths in leading the team. The return on the investment in time will be huge in the future success of the organization.

The third step to success for leaders assigned to a non-KD team is to know their customers and to know their product. These may be business terms, but identifying customers and products is critical for the non-KD team. The customer might be the individual Soldier, or it could be a battalion or brigade commander. Once leaders figure out their customers, they can then direct all their energy toward the main effort. Leaders who stress to themselves the importance of properly serving their customers will undoubtedly provide them with a quality product, whether it is processing a leave form or staffing a unit supply request. For leaders who serve at an Army Reserve Officers' Training Corps unit or at West Point, the product will be future second lieutenants. With minimal contact time each week, these leaders must ensure that those hours are of the highest quality. This is the challenge and excitement of being a leader, regardless of what type of team is being led. Leaders should figure out their mission, define main and supporting efforts, resource appropriately, and lead from the front.

Lastly, leaders must motivate. While every leader wants to be part of the Army's great historical units and wants those key and developmental assignments, those slots are not available for everyone. Many Soldiers want those exciting assignments as well. Leaders of non-KD organizations must recognize that the members of their team may not be highly motivated. Due to this fact, officers will need to exert as much (or more) leadership energy to lead non-KD units as they would to more glamorous units. Staff sections often get a bad reputation because the assignment is not adventurous, so Soldiers stumble into stereotypes. Everyone has heard Soldiers say that members of the staff are lazy, that they leave the workplace early every day, and that they always lose that important piece of paperwork. New leaders must not allow this to happen. If assigned to a personnel section, they should make it the best personnel section the Army has ever seen. If the assignment is to an Army Reserve Officers' Training Corps battalion, the leader should try to make it the most exciting unit the cadets will ever see. This is what makes the U.S. Army special. One leader can change everything. If the officer and NCOIC are motivated and on the same azimuth, there will be no ceiling to what they can accomplish.

"This is the challenge and excitement of being a leader, regardless of what type of team is being led. Leaders should figure out their mission, define main and supporting efforts, resource appropriately, and lead from the front."

Leaders should realize that every Army assignment is exhilarating in some way. Those key-and-developmental assignments are undoubtedly the highlight of a career; but equal or greater amounts of time will be spent outside those roles, so officers must be prepared to lead the non-KD team. By completing some research, investing in the officer-NCO relationship, determining the customer and the product, and motivating the team, new leaders will excel in whatever task their commander assigns to them. These non-KD units can be equally exciting in their own way. I am still deeply proud of my teams' accomplishments in the transitional assignments between my KD positions. Leaders who take some of the ideas presented above and apply them to their nonstandard assignments will also find success.

A platoon leader from an engineer battalion views a newly constructed bridge in Iraq.

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Deploying the Heavy Assault Bridge: Lessons Learned in Operation Iraqi Freedom

By Captain Nathan A. Jennings and Master Sergeant Brent A. Saxton

In September 2009, coalition forces in the volatile southernmost district of Kirkuk Province, Iraq, grappled with a compelling mobility issue. The partnered units (1st Battalion, 15th Brigade of the Iraqi Army, and C Troop, 4th Squadron, 9th Cavalry, 2d Brigade Combat Team, 1st Cavalry Division of Multinational Division–North) found their patrol range stymied by a river west of a small town called Al Awashra. The town is located in an isolated hinterland brimming with Al Qaida in Iraq sympathies. Running north to south along a deep wadi system, the river and its unstable bridge prevented partnered armored patrols from maneuvering into the eastern reaches of the operational environment.

Since a spectacular Al Qaida in Iraq-affiliated attack near Kirkuk had recently originated in the vicinity of Al Awashra, the partnered commanders urgently explored options for emplacing a load-bearing bridge to facilitate crossing for American mine-resistant, ambush-protected vehicles and Iraqi high-mobility, multipurpose, wheeled vehicles.[1] After it was decided that a semipermanent structure was not feasible, the solution was to emplace a military heavy assault bridge (HAB). While this quick fix would provide a panacea for the tactical dilemma, it would also reveal lessons beneficial to future deployments in operational settings. Centering on the need to balance methodical preparation against the demands of high operational tempo, this article captures those insights in three successive phases: planning and reconnaissance, movement and staging, and bridge installation.

Planning and Reconnaissance

The first phase of C Troop's effort to emplace a HAB at Al Awashra was mission preparation. As an initial reconnaissance in early September to assess options,

the troop commander escorted the 2d Brigade Combat Team engineer and the partnered Iraqi battalion executive officer to the site. After determining that the 18-foot span of the existing abutments could support the 11-ton bridge and the additional 30 tons of mine-resistant, ambush-protected vehicles, higher headquarters approved the HAB as the most feasible solution. Since the operation would require combined operations by elements of Forward Operating Base Warrior and Joint Base Balad, the mission required planning across separate divisions within Multinational Corps–Iraq.

With the Iraqi partners enthusiastic about a cost-free enhancement to their maneuver range, involved echelons coordinated the convergence of the improvised company team at Kirkuk. Beginning with local elements, it consisted of the command team and 1st Platoon of C Troop for security, an explosive ordnance disposal team for site clearance, and two heavy equipment transport (HET) systems of the 15th Brigade Support Battalion to transport two M88A2 armored recovery vehicles. The team would be completed by an engineer platoon and two HETs from Logistics Support Area Anaconda to transport the separate components of the M104 Wolverine tracked carrier and its HAB to a forward staging area. Once near the bridging site, the M88A2s would transfer the HAB to the carrying arm of the Wolverine for final transport and emplacement. The resulting assembly revealed the first lesson of the mission: the value of integrating a nuanced assessment of unit readiness into the larger planning process. While multiple echelons rapidly organized the proper assets, the hasty nature of the mobilization would prove to be a liability.

Movement and Staging

The second phase of the mission centered on the stages of movement to a tactical staging point, initial assembly, and transfer of the HAB from the HET to the Wolverine. On 8 September, the requested engineer and transport elements arrived from Balad with the requested bridge-laying system. The team deployed in a convoy the next morning at 0600, with HETs transporting the heavy equipment. After driving about 70 kilometers south along the Tikrit highway, the team arrived at the town of Raml, 12 kilometers west of the bridging site. The convoy then moved eastward into the desert, established a hasty tactical assembly area (TAA) with security patrols by gun trucks and a scout weapons team, and downloaded the M88A2s and the Wolverine to prepare to transfer the HAB.

At this point, leaders learned the most crucial lesson of the mission: the importance of balancing training and rehearsals against the demands of high-tempo operational timelines that often prize combat expediency. While higher planners had assigned an engineer platoon and appropriate equipment, none of the engineers had any knowledge of the Wolverine or the HAB it emplaces. As horizontal construction engineers in a light infantry brigade combat team, they had no resident expertise with armored bridge-laying techniques.[2] To make matters worse, the mission came with

Operators use armored recovery vehicles to suspend the HAB in preparation for attachment to the Wolverine in the background.

little advance notice. As a result, the operators arrived at the TAA utterly unprepared for the technical complexity of transferring and attaching the HAB to the carrying arm of the Wolverine.

As the team explored the unfamiliar procedure for using M88A2 booms to lift, suspend, and fix the folded HAB to the M1 Abrams tank chassis of the Wolverine over the next 6 hours, mission tempo ground to a halt. In the process, the operators damaged components of the Wolverine carrying-arm system, jeopardizing mission success. After much trial and error, the engineers attached the bridge, while the C Troop first sergeant (a career tanker) instructed the novice crew on Wolverine movement operations. At this point, the convoy split into two sections. The four HETs and four gun trucks moved to an alternate TAA, while the remaining gun trucks, the explosive ordnance disposal team, the two armored recovery vehicles, and the Wolverine carrying the HAB proceeded east toward the bridging site at Al Awashra. After 2 hours of deliberate travel through restrictive terrain, the patrol arrived at the site as darkness fell.

Bridge Installation

The arrival of the team at Al Awashra initiated the final phase of the operation: bridge installation. With the Iraqi partners on-site to assist with security, the explosive ordnance disposal team cleared the site of potential explosives and the engineers positioned the Wolverine to extend the HAB. Unfortunately, after numerous attempts to use the launch system to extend the bridge over the river further damaged components of the supporting arm, the device was inoperative. The process of attaching the bridge to the Wolverine carrying arm had taken its toll. Complicating the situation further, the HAB could not be fully retracted and had to be abandoned near the site. With the mission now unachievable, the team reunited with the transportation element at the alternate TAA, uploaded the disabled Wolverine and M88A2 vehicles onto the HETs, and returned to Forward Operating Base Warrior. Two days later, the Balad elements returned to home base.

The learning point from the debacle at Al Awashra was obvious but instructive: technical assets required mission-focused training before delivery to a combat environment. While admirably embodying the *Essayons* ("Let Us Try") motto of the Corps of Engineers, the platoon had deployed with insufficient preparation. Even more unsettling, if a higher scheme of maneuver had depended on opening the crossing point for decisive movement, the bridging disaster could have had far-reaching consequences.

This mission failure represented deficient leadership across multiple echelons. At the platoon level, leaders who deployed the equipment with untrained operators should have demanded more training time to develop technical expertise. The engineer chain of command at the company and battalion levels also should have objectively assessed the readiness of their unit for such an endeavor upon receipt of the mission. The troop commander also shared responsibility for not personally assessing the proficiency of the most critical system to the operation as part of troop-leading procedures. Finally, planners at the higher echelons made unfounded assumptions about the capability of infantry brigade combat team Soldiers to operate armored systems. These omissions and the failure of senior noncommissioned officers (NCOs) to advise leaders of unit readiness established the conditions for undue friction at Al Awashra.

Despite the dispiriting nature of the attempt, the Al Awashra bridging mission was not yet over. Two weeks later, the company team redeemed itself. After resupplying at Balad, selecting a new HAB, and training on the Wolverine system, the engineers returned to attempt installation again. The same cavalry, engineer, transportation, and explosive ordnance disposal elements conducted troop-leading procedures, moved to Raml, and established another TAA. The mission commander again established security with scout weapons team support while the engineers began to mount the HAB on the Wolverine. While quicker than the previous attempt,

The Wolverine, with the HAB in place, maneuvers to the bridging site.

the procedure still consumed several hours as the operators carefully sought to avoid harming the system. While they managed to complete the task, revealing the value of methodical training, the operation was still slowed by the absence of an experienced NCO to troubleshoot technical issues.

The Wolverine emplaces the HAB as coalition partners look on.

Despite additional damage to interlocking components on the bridge, which prevented the system from functioning properly, this time the Soldiers repaired the structure by cannibalizing the previously discarded bridge. These improvised fixes finally allowed the engineers to extend and emplace the bridge over the crossing point. With both Iraqi partners and American Soldiers looking on, the HAB settled firmly into position as darkness fell. Once engineer leaders examined the support structure and pronounced it structurally sound, the Iraqis tested the integrity of the crossing with a light truck, followed by an American mine-resistant, ambush-protected vehicle.

The second attempt at emplacing the bridge proved successful, despite continuing limitations, such as the absence of a licensed Wolverine operator and an experienced supervisor. The units involved learned from previous mistakes and prepared with specific training for technical tasks. Additionally, the belated success at Al Awashra was due to the perseverance of the NCOs, who worked tirelessly for hours in the Iraqi sun to negotiate technical challenges. It was these leaders, as they assumed ownership of an unfamiliar system, who carried the team through to mission achievement.

Conclusion

Following the emplacement of the HAB in Al Awashra, the Iraqi **a**nd American units maximized their patrol range in southern Kirkuk Province. The bridge achieved its intended purpose of providing mobility to the partnership in a difficult combat environment. While these immediate benefits were critical, the lessons learned in pursuit of this upgrade over two arduous attempts, lasting more than 24 hours each, are equally important. In the planning process, collaboration up and across multiple echelons rapidly produced the necessary solution, yet needed more nuanced assessment. Company leaders found that mission-focused rehearsals are always vital to operational success, despite compressed timelines. Finally, and perhaps most importantly, the efforts to install the bridge at Al Awashra revealed the capacity of Soldiers to negotiate challenges. This final aspect—the value of assessing, learning, and adapting in an operational setting—is perhaps the most important lesson of all.

Endnotes:

[1]Ali Al Winadawi and Ned Parker, "Suicide truck bomb kills at least 70 in Taza, Iraq," *Chicago Tribune*, 21 June 2009, <http://articles.chicagotribune.com/2009-06-21/news/0906200170_1_kirkuk-maliki-town-in-northern-iraq>, accessed on 18 March 2014.

[2]Since it is designed to support mechanized movement, the M104 Wolverine is typically crewed by combat engineers in armored brigade combat teams.

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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			
FM 3-34	*Engineer Operations*	Apr 14	This revised version contains the "box top" as our doctrinal framework; integrates the three engineer disciplines of combat, general, and geospatial engineering; and introduces the four lines of engineer support for decisive actions. **Status:** Published on 8 April 2014.
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:** The final draft was sent for worldwide staffing in April 2014. To be published 1st quarter, fiscal year (FY) 2015.
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**: The final draft was sent for worldwide staffing in April 2014. To be published 1st quarter, FY 15.
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:** Anticipate the final draft to be sent for worldwide staffing in June 2014. To be published 2d 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 4th quarter, FY 14.
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:** The final draft was sent for worldwide staffing in April 2014. To be published 1st quarter, FY 15.
ATP 3-90.8 (FM 3-90) (FM 5-102) (FM 90-7)	*Combined Arms Countermobility Operations*	Jul 01 Mar 85 Sep 94	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:** The final draft has been approved by the U.S. Army Engineer School (USAES) commandant and is now awaiting U.S. Marine Corps (USMC) approval. To be published 4th quarter, FY 14.
ATP 3-90.37 (FM 3-90.119)	*Combined Arms Improvised Explosive Device Operations*	Sep 07	This is a conversion from FM 3-90.119, *Combined Arms Improvised Explosive Device Defeat Operations*, to ATP 3-90.37. **Status:** Staffing of the final draft is complete, and the final approved draft is being prepared. To be published 4th quarter, FY 14.

ENGINEER DOCTRINE UPDATE

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

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 4th quarter, FY 14.
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 4th quarter, FY 14.
ATP 3-34.45 (FM 3-34.480)	*Power Generation/ Distribution*	Apr 07	This multi-Service manual is a conversion from FM 3-34.480, *Engineer Prime Power Operations*, to ATP 3-34.45. **Status:** The development of this ATP is on hold until late FY14 or early FY15.
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:** Anticipate the final draft to be sent for worldwide staffing in June 2014. To be published 2d quarter, FY 15.
Geospatial Engineering			
ATP 3-34.80 (FM 3-34.230)	*Geospatial Engineering*	Mar 08	This is a conversion from FM 3-34.230, *Topographic Operations*, to ATP 3-34.80. **Status:** Staffing of the final draft is complete, and the final approved draft is currently with Combined Arms Doctrine Development at Fort Leavenworth, Kansas. To be published 4th quarter, FY14.

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 5 December 2013.

2. Items in parentheses are publication numbers of current publications, which will be 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>.

An Introduction to Humanitarian and Civic Assistance in Thailand

By Captain John D. Bernhardt and First Lieutenant Samuel A. Bader

The 303d Maneuver Enhancement Brigade (MEB) was the U.S. lead for the Combined Joint Civil–Military Operations Task Force at Cobra Gold 2014. The 303d MEB is a unique, multifunctional brigade headquarters with subordinate signal, sustainment, and maneuver units that can be task-organized with additional engineer, chemical, and military police formations into a mission-tailored force that conducts support area operations, maneuver support operations, consequence management support operations, and stability operations to assure the mobility, protection, and freedom of action of the supported force. As a robust brigade level organization, the 303d MEB brought several unique capabilities to the mission that have not been used before in Cobra Gold.

Cobra Gold 2014 was the 33d annual U.S. Pacific Command exercise designed to advance regional security and ensure effective response to regional crises by exercising a robust multinational force from nations sharing common goals and security commitments in the Asia-Pacific region. The task force is truly combined and joint; Soldiers, Marines, Sailors, and Airmen from the United States worked with military personnel from Thailand, Japan, the Republic of Korea, Singapore, the People's Republic of China, Malaysia, and Indonesia under the Humanitarian and Civic Assistance (HCA) Program. This represented the first substantive experience with such a broad array of foreign military members for many of the U.S. personnel.

Multinational military personnel work together to apply stucco to a wall on a school construction site in Thailand.

The HCA Program is authorized by Title 10 of the U.S. Code and is designed to promote the security interests of the United States and the host nation, while improving specific operational readiness skills of U.S. forces. Typical HCA activities include—

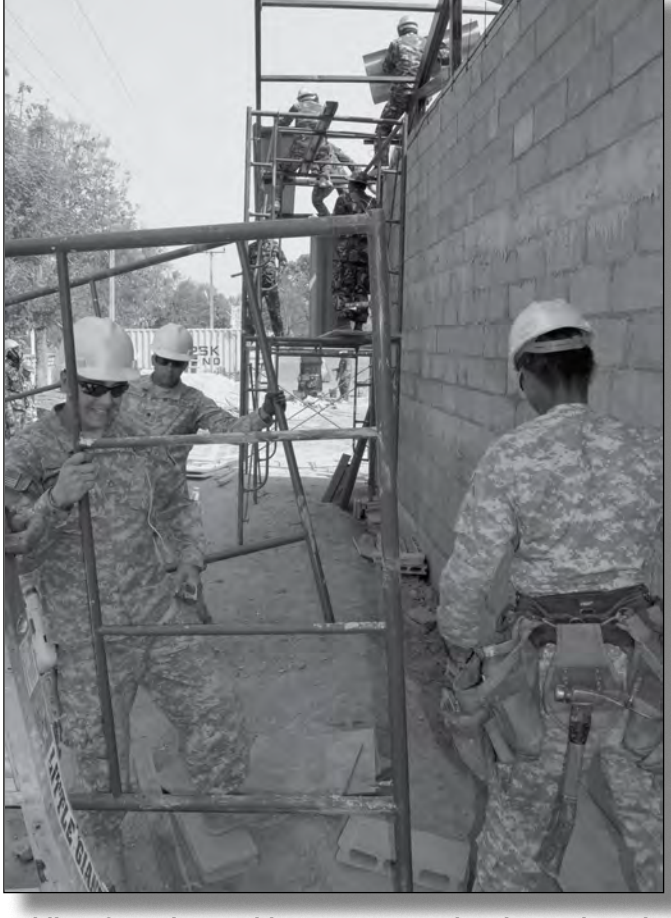
- Construction and repair of public facilities and basic sanitation facilities.
- Well drilling.
- Construction of rudimentary surface transportation systems.
- Medical, dental, and veterinary care in rural and underserved areas.

HCA at Cobra Gold 2014 included Engineering Civic Action Program (ENCAP) projects and cooperative health engagements. ENCAP projects focused on building additional classroom space at four elementary schools in rural Thailand. ENCAP planners met with school principals and local government officials to determine how construction would best meet area needs. The ENCAP sites used standard designs to streamline construction and allow completion within the 23-day timeline specified for the exercise. The buildings were 7.8 by 20 meters, with concrete masonry unit construction and one to three classrooms inside.

Task force and ENCAP site officers in charge benefited greatly by using equipment available through the U.S. Army Corps of Engineers (USACE) Reachback Operations Center. USACE teleengineering communications equipment (TCE) was valuable in maintaining communication with remote sites. Traditionally, local cellular telephones provide voice and data connectivity for site officers in charge to send daily construction status reports to the task force headquarters. However, in the rural areas which are most in need of the HCA program, cellular telephone reception is often unreliable. The broadband global area network equipment included in the TCE allowed ENCAP sites to conduct video teleconferences with higher headquarters, send daily personnel and construction status updates and photographs via e-mail, and conduct nonsecure telephone communication when local cellular service was insufficient. USACE initiatives and expertise have proven vital to the success of the 303d MEB.

The Automated Route Reconnaissance Kit (ARRK) was also a valuable tool in HCA planning. Contracted drivers were often unfamiliar with the rural areas where most projects took place. This could delay the arrival of personnel, construction equipment, and materials. In the future, the ARRK should be a part of HCA planning. If used during HCA site surveys, the ARRK data can reduce transportation delays by creating still images of key intersections and providing accurate maps with directions to ENCAP sites.

The TCE and ARRK proved to be such valuable mission enablers that the task force joint manning document was restructured to add a dedicated TCE and ARRK suite operator in the grade of staff sergeant. This noncommissioned officer had already attended the TCE and ARRK training offered by USACE and served as the subject matter expert



Soldiers from the Washington Army National Guard 176th Engineer Company assemble scaffolding.

on their maintenance and employment during Cobra Gold 2014. A brief familiarization class on the equipment was also given for the benefit of Cobra Gold partner nations during the cooperative health engagement tabletop exercise held in Phitsanulok, Thailand. Following the successful conclusion of Cobra Gold 2014, the 303d MEB is now working to capitalize on its institutional experience by training more operators/maintainers as time and funds permit.

HCA missions present many unique challenges to units more accustomed to fighting the War on Terrorism for more than a decade. While the Cobra Gold HCA mission is valuable to the people of Thailand, it also represents a significant learning opportunity in executing tactical, combined, and joint engineering projects to U.S. Soldiers, Marines, Sailors, and Airmen and to the military personnel of the other participating nations. The additional assets leveraged by the 303d MEB (such as the broadband global area network, the TCE, and ARRK) were valuable enablers to the success of the mission.

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Construction Quality Management

By Captain Justin R. Smith

Construction quality management, "the performance of tasks, which ensure that construction is performed according to plans and specifications, on time, within a defined budget, and [within] a safe work environment," is the system for achieving high quality within the U.S. Army Corps of Engineers (USACE).[1] Construction quality management was the primary reason I applied for an internship with USACE. I wanted to determine how it produced such high-quality projects so that I could apply that knowledge to the Regular Army. I quickly learned that operational units in the Regular Army will never match USACE quality. The Regular Army mission and culture are not geared toward that level of quality. Engineer Soldiers train as infantry, deploy, conduct field exercises, and sustain the normal functions of an Army unit. They cannot compete with the expertise of contractors, whose only requirement is to perform their specific function.

Despite the differences between USACE and the Regular Army, an understanding of some of the key concepts of construction quality management can help operational unit leaders improve quality within their own units. Exact changes are outside the scope of this paper; different factors of mission, enemy, terrain and weather, troops and support available, time available, and civil considerations warrant varying levels of concern about quality. When quality is a top concern, however, the following five concepts of construction quality management are a good place to start—

Relationship Between Quality Control (QC) and Quality Assurance (QA). QC is the contractor's required internal system to achieve quality standards by meeting

specifications, finishing on time, staying within budget, and maintaining a safe environment. QA is the USACE system to ensure that the QC program is functioning properly. To ensure that this relationship works, USACE mandates strict requirements for the contractor QC program, such as having a QC manager who is authorized to stop project work and maintaining a detailed QC plan approved by USACE. The take-away is that construction quality management requires a QC system to monitor construction and a QA system to ensure that the control system works. This multilayered system effectively pushes the responsibility for quality onto the contractor, while keeping a monitoring and tracking system at the USACE level. The QC/QA relationship may be a helpful framework from which to borrow ideas when considering senior-subordinate relationships on operational construction projects.

Preconstruction Planning Phase. The second important concept within construction quality management is the length of the planning phase before construction begins. The number of plans USACE requires from contractors is astonishing. Required submittals before construction may include, but are not limited to—

- *Detailed schedule in a Gantt chart format.* This schedule allows critical path identification, resource management, time estimates, and activity sequencing.
- *QC plan.* This plan outlines how the contractor will ensure a quality product, to include lines of authority, testing procedures, qualifications of jobsite personnel, definable features of work, and deficiency tracking.
- *Accident prevention plan.* This requires certificates for designated competent persons in each hazard category, general safety policies, accident reporting procedures, and specific hazard analysis plans for each type of work completed on the project.
- *Environmental protection plan.* This consists of many smaller plans, to include storm water pollution prevention; traffic control; air pollution control; spill prevention and control; contaminant prevention; biological and wetlands management; historical, archeological, and cultural resource preservation; wastewater management; and recycling and solid waste minimization.
- *Sampling and analysis plan.* This covers the storage and testing of material for contamination. It typically includes processes for sampling, procedures when contaminants are found, statistical analysis methods, and information about current site conditions.
- *Demolition plan.* This is required when conducting demolition work and consists of processes, waste management, and procedures for possible hazmat such as asbestos and lead-based paint.
- *Design submittals.* For projects in which the contractor receives requirements but not specific plans (known as design-build projects), the designs are also due before construction can begin. Updated plans must be submitted when the design is at 65 percent, 95 percent, and 100 percent complete.

It is not unusual for contractors to spend 5 or 6 months planning and preparing for a project that is due in 1 year. The USACE level of required planning is impressive, but the method is not feasible—or probably desirable—for most operational construction projects. The lesson here is that quality is not an accident. If an operational unit really considers quality a high priority, then time must be allotted for meticulous planning.

USACE workers from the Alaska District place concrete at a new tactical equipment maintenance facility at Joint Base Elemendorf-Richardson.

Documentation and reporting. The third important construction quality management concept is USACE's thorough documentation and reporting. This concept is especially important because of the USACE relationship with contractors; the potential for legal action over disagreements is always possible. As covered under planning, USACE requires a number of submittals before construction begins; however, the requirements continue throughout the construction process. Required submittals during construction include—

- Arrival of materials at a jobsite.
- Results of tests conducted.
- Changes to key personnel qualifications.
- Requested design changes.
- Equipment maintenance data.
- Safety information.

These submittals are identified before the project begins and are organized through a submittal register and a transmittal form.[2, 3] The register lists the required submittals, and the transmittal form acknowledges receipt. In addition to these required reports, construction quality management requires reports from QA personnel for each site visit and reports from QC personnel daily. These reports include items such as—

- Weather.
- Narratives of the day's work.
- Activities started or finished.
- Deficiencies.
- Labor hours.
- Equipment hours.
- Accidents.

QA and QC reports allow tracking and provide a record of work and conditions. Another significant form of documentation used by USACE is meeting minutes. The minutes can be typed before the meeting to keep participants focused, used for handwritten changes during the meeting, and signed at the end of the meeting to ensure that major stakeholders are in agreement with the conclusions. Meeting minutes, along with sign-in rosters, then provide additional records in case of disagreements. These three forms of documentation—submittals, daily reports, and meeting minutes—are especially important to USACE due to its lack of command relationship with contractors, but the clarity provided by such meticulous documentation applies to all construction units. Operational units could require meeting minutes or reexamine current reporting requirements to improve documentation.

Safe work environment requirement. The fourth important concept within construction quality management addresses the specific requirement for work to be completed within a safe environment. In most ways, USACE safety programs parallel risk management in any other part of the Army. For each aspect of a project, USACE requires an activity hazard analysis that identifies potential hazards, controls, and levels of risk. One difference, however, is that this analysis requires information not specifically required in a risk assessment, to include—

- Equipment to be used.
- Chemicals to be used (including material safety data sheets).
- Inspection requirements during tasks.
- Training requirements.

Operational commanders typically have access to this information, either within the controls for that risk assessment or in a dispatch for the project. In specific instances, such as operating a crane or handling unusual chemicals, this additional reiteration might be worthwhile. Another way that safety is different within USACE is through Engineer Manual 385-1-1, *Safety and Health Requirements Manual*.[4] This gigantic manual outlines the USACE regulations that contractors must follow, while still meeting national standards, such as those set by the Occupational Safety and Health Administration. Its current 796 pages, not including appendixes, detail required safety procedures for sanitation, hazmat, power tools, and work sites. While requiring strict adherence to such a mammoth list of requirements could lead to risk aversion within the Regular Army, the manual is an excellent resource when brainstorming controls to keep Soldiers safe on construction projects. Requiring additional information on a composite risk management work sheet and referencing Engineer Manual 385-1-1 are simple ways that operational units might establish a safer work environment.

Three-Phase Control System. The fifth important concept within construction quality management is the three-phase control system. This simple but effective system is designed to ensure that the QC manager (the contractor) effectively supervises work and finds discrepancies as early as possible. One key aspect is that all phases occur for each individual part of a project with specific standards, known as a definable feature of work. The system consists of the preparatory phase, the initial phase, and the follow-up phase.

The preparatory phase consists of everything that must happen to get ready to begin a feature of work and culminates with a preparatory meeting. The preparatory meeting covers a review of the required specifications, a check to ensure that conditions are set, and a discussion of safety.

The initial phase consists of an on-site meeting to inspect a representative sample of completed work. This phase is the key for achieving quality for that feature. The initial phase allows the QC manager to verify that standards are being observed, workmanship is at the appropriate level, and the safety plan is being implemented. By checking the work in the initial phase, the QC manager can ensure early in the process that the work conforms to the desired quality.

If this meeting goes well, that feature moves into the follow-up phase; but if there are personnel changes or discrepancies with work in the future, the initial phase must be repeated. The follow-up phase consists of daily checks to ensure that everything is still progressing correctly.

Of the three phases of control, the preparatory and follow-up phases are routine ideas: get everything ready and continue to supervise once the work is proceeding. The key is the initial phase of inspecting a representative sample to reach a common understanding early in the process. If units can implement just one aspect of construction quality management when performing construction, they should incorporate an initial phase with a meeting whenever possible. Units typically use confirmation briefs and rehearsals to achieve the same purpose, but analyzing a representative sample is the ideal.

Clearly, units should not try to entirely model the construction quality management system, but possessing and integrating the knowledge of the system principles will help maximize quality construction within operational constraints. Individual leaders must consider which specific changes will improve quality in their units without significantly degrading flexibility or impeding the freedom of action by subordinates.

My USACE internship was a worthwhile experience that gave an overview of USACE operations and helped me stay connected with the body of professional engineers. An alternative for units that cannot spare a leader for 3 months is the 2-day construction quality management course that USACE districts require for contractors. As a leader development opportunity, this course gives students an overview of the construction quality management process and would give junior officers and noncommissioned officers a new perspective on producing quality results.

References:

[1]*Construction Quality Management for Contractors*, Student Study Guide, USACE Professional Development Support Center, Control No. 784, Revised 2004.

[2]Engineer Form 4288-R, *Submittal Register*, January 1997.

[3]Engineer Form 4025-R, *Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificates of Compliance*, March 1995.

[4]Engineer Manual 385-1-1, *Safety and Health Requirements Manual*, 15 September 2008.

Captain Smith is attending the Engineer Captains Career Course at Fort Leonard Wood, Missouri. Earlier, he served as an intern with the U.S. Army Corps of Engineers, Alaska District. He holds a bachelor's degree in engineering management from the U.S. Military Academy.

ENGINEER WRITER'S GUIDE

Engineer is a professional-development bulletin designed to provide a forum for exchanging information and ideas within the Army engineer community. We include articles by and about officers, enlisted Soldiers, warrant officers, Department of the Army civilian employees, and others. Writers may discuss training, current operations and exercises, doctrine, equipment, history, personal viewpoints, or other areas of general interest to engineers. Articles may share good ideas and lessons learned or explore better ways of doing things.

Articles should be concise, straightforward, and in the active voice. If they contain attributable information or quotations not referenced in the text, provide appropriate endnotes. Text length should not exceed 2,000 words (about eight double-spaced pages). Shorter after action type articles and reviews of books on engineer topics are also welome.

Include photographs (with captions) and/or line diagrams that illustrate information in the article. Please do not include illustrations or photographs in the text; instead, send each of them as a separate file. Do not embed photos in Microsoft PowerPoint® or Word®. If illustrations are in PowerPoint, avoid the excessive use of color and shading. Save digital images at a resolution no lower than 200 dpi. Images copied from a Web site must be accompanied by copyright permission (see our photographer's guide at <http://www.wood.army.mil/engrmag/Photograph%20Illustration%20Guide.htm>).

Provide a short paragraph that summarizes the content of the article. Also include a short biography, including your full name, rank, current unit, job title, and education; your mailing address; a fax number; and a commercial daytime telephone number.

Articles submitted to *Engineer* ***must*** be accompanied by a written release by the author's unit or activity security manager prior to publication (see <http://www.wood.army.mil/engrmag/writersguide.htm>). All information contained in the article must be unclassified, nonsensitive, and releasable to the public. *Engineer* is distributed to military units worldwide and is also available for sale by the Government Printing Office. As such, it is readily accessible to non-government and foreign individuals and organizations.

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Engineer is published three times a year: April (article deadline 1 December), August (article deadline 1 April), and December (article deadline 1 August). Send submissions by e-mail to <usarmy.leonardwood.mscoe.mbx.engineer@mail.mil> or on a CD in Microsoft Word, along with a double-spaced copy of the manuscript, to: Managing Editor, Engineer Professional Bulletin, 14010 MSCoE Loop, Building 3201, Suite 2661, Fort Leonard Wood, MO 65473-8702.

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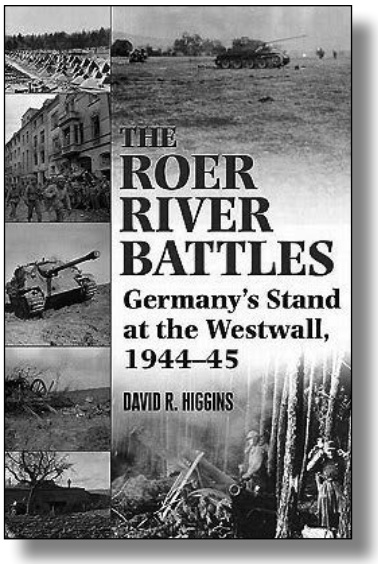
Book Reviews

Self-development is a major pillar in the growth of Army leaders. One tool to aid in this is the "Engineer Commandant's Reading List" at <http://www.wood.army.mil/usaes/library/documents/ENGR_CMDT_READING_LIST_2012.pdf>. It includes a variety of books on history, politics, and culture that are appropriate for Soldiers and civilians in the Engineer Regiment. The list is not all-inclusive and will be updated over time.

Book reviews will be a feature in each issue of *Engineer*. Authors will summarize the contents of books of interest and will point out the key lessons to be learned from them. Readers who wish to submit book reviews may forward them to <usarmy.leonardwood.mscoe.mbx.engineer@mail.mil>.



The Roer River Battles: Germany's Stand at the Westwall, 1944–45, by David R. Higgins, Casemate Publishing, 2010, ISBN 978-1935149293.

Reviewed by Lieutenant Colonel Brian E. Bart

The Roer River Battles: Germany's Stand at the Westwall, 1944–45, by David R. Higgins, provides an operational level perspective of Allied forces in their final push to the Rhine River during the winter of 1944. The Allied logistic tail was at its limit following the Normandy breakout and sweeping push across France. With a severely strained logistic system, the American, British, and Canadian military machine literally ran out of gas at the doorstep to Germany. The issue for Allied planners was how best to maintain momentum and contact with the enemy while dealing with limited resources. The result was a near pause in operations at the edge of the Roer River; the Huertgen Forest; and the Westwall, a line of defensive forts, bunkers, and tank defenses that stretched along the western border of Germany.

Terrain became a significant obstacle for Allied planners accustomed to maneuvering through the open plains of France. The multiple gap-crossing requirements of the Roer River area provided German forces with the advantage of natural barriers to defend. Blowing bridges during their retreat, German engineers forced mechanized forces to be funneled across a few remaining bridges and low-water crossing sites. Allied engineers were hard-pressed to meet the demands placed on them by maneuver forces with road crater repair, bridge emplacement, and reduction of minefields and wire obstacles.

Similar to the problems they faced with the hedgerows of Normandy, Allied forces confronted extremely difficult terrain for mechanized forces to maneuver through. A mix of riverine, urbanized, and forested areas now posed a series of defensible terrain features. Winter weather (consisting of rain, cold, and fog) also enhanced the ability of the defenders to blunt Allied advances. All of these types of terrain are difficult by themselves; when combined, they provide a combat multiplier for defenders. The complex terrain soon devoured large Allied formations and devolved into uncoordinated, small-unit actions at company and platoon levels. The fighting in the Huertgen and surrounding forests quickly isolated Allied units in thickly wooded ravines, mitigating the advantages of Allied artillery and air cover. Communications between units were problematic, with units being quickly cut off from their commands by terrain features. Landlines served as the only reliable means of communicating with units at the front.

The Roer River landscape was full of multiple creeks, river tributaries, marshy areas and, most of all, mud that slowed or even halted the progress of armor until engineers conducted gap-crossing operations and improved road conditions. It provided many natural features where German forces could tie in wire obstacles, minefields, and field fortifications. Mine-flail tanks proved effective in breaching lanes in minefields and wire obstacles. German engagement area development centered on likely crossing sites and required

extensive Allied firepower to reduce and destroy obstacles within them.

General Dwight D. Eisenhower's broad-front strategy did not allow Allied forces to bypass strongpoints or leave troop concentrations in their rear or on their flanks. Therefore, the Allied decision to attack Aachen was predetermined. This decision is counter to the preferred doctrinal method for urban areas of bypass and isolate. The battle for Aachen became an intense urban fight that favored the German defenders, who intended to bleed the attackers through attrition. Narrow streets filled with rubble limited Allied armored vehicles and restricted fields of fire. Of minimal value to the Allies, Aachen was psychologically significant to the German soldiers and their higher command. The birthplace of Charlemagne, it was the largest German city threatened with capture on the Western Front thus far. Ordered to stand at all cost, German defenders would fight to the last man. As with previously encountered cities, urban fighting was a bare-knuckle brawl that required house-to-house fighting and block-by-block clearing. The use of subterranean passages and sewer systems, along with multiple building elevations, resulted in a three-dimensional fight above, below, and at ground level.

The Huertgen Forest proved to be a quagmire for U.S. Army planners seeking a quick route through German defenses. The Allies lacked an understanding of complex, forested terrain and failed to comprehend the difficulties associated with forest combat. Difficulties included maintaining communications with frontline units; restrictive terrain and the threat of isolation of units; primitive road networks that limited the use of armor; difficulties of resupply and extraction of wounded; and an inability to coordinate combined arms attacks. Weather made conditions worse. With rain and fog, came mud and limited visibility. The Germans understood fighting in heavy forest from their experiences on the Eastern Front. In addition, the Germans made extensive use of booby traps and snipers in trees and employed antiarmor teams to ambush lead vehicles so that narrow routes were blocked. Artillery and mortar fire caused tree bursts of shrapnel and wood fragments, requiring the construction of overhead cover for all fighting positions; open foxholes or trenches proved of little value.

The lack of major roads or serviceable routes severely restricted armor support to frontline infantry, slowed logistics, and hampered casualty evacuations. In an effort to offset muddy terrain and ensure mobility, engineers constructed corduroy roads (a combination of logs tied together with wire and covered with soil or rock). Engineers built bridges, reduced minefields, breached wire obstacles with bangalore torpedoes, and used demolitions to destroy concrete and steel field fortifications and pillboxes. Forest terrain threatened to slow communications and obstruct mutual support during Allied offensive operations. The Germans exacerbated the threat with localized counterattacks when possible, with the intent of dislodging and overrunning isolated units. Developing tactics, techniques, and procedures and conducting rehearsals before entering the Huertgen Forest would have helped minimize the casualties sustained by American forces.

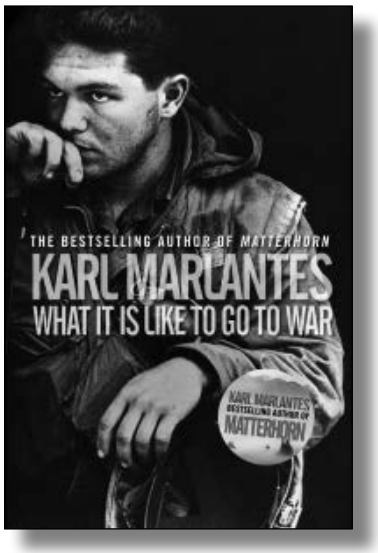
The Westwall acted like a backbone running down the German defensive effort. A static defensive barrier with fixed fortifications, it served to keep France out of prewar Germany. After the invasion of France in 1940, the German Army made minimal efforts to maintain its defensive capabilities. With the Allied invasion of Normandy in 1944

"The fight in the Roer River area . . . highlights the significant engineer effort required by Allied forces during this campaign."

and the retreat of German forces toward their own border, a renewed emphasis was placed on restoring the Westwall defenses. They soon provided a modicum of protection for German forces attempting to reconstitute and reorganize. Allied engineer operations included the engineer reconnaissance of defensive works and possible bypass lanes. Engineers breached minefields and wire obstacles and defeated antiarmor tank ditches and dragon's teeth.

The Roer River Battles: Germany's Stand at the Westwall provides a great read for anyone interested in the history of World War II for the period between the Normandy breakout and the Battle of the Bulge. The book highlights the difficulties of large-unit formations conducting maneuver warfare against a static defensive line mixed with the complex terrains of urban and forested landscapes. The book provides a detailed listing of which divisions, Allied and German, participated in what engagements. A more-detailed examination of why senior American leaders ventured into the Huertgen Forest and its associated difficulties would have added significant value for readers hoping to understand and appreciate this portion of the campaign. The fight in the Roer River area—with its complex terrain, minefields, wire and point obstacles, river crossings, weather, and determined German defense—highlights the significant engineer effort required by Allied forces during this campaign.

Lieutenant Colonel Bart is the total force integrator at the Concepts, Organizations, and Doctrine Development Division of the Capability Development and Integration Directorate, Maneuver Support Center of Excellence, Fort Leonard Wood, Missouri. He is a graduate of the Joint and Combined Warfighting School—Joint Professional Military Education II, the Joint Engineer Operations Course, and the Advanced Operations Warfighter Course. He holds a bachelor's degree in business administration from College of the Ozarks at Point Lookout, Missouri; and a master's degree in business administration from Webster University.



What It Is Like to Go to War, by Karl Marlantes, Atlantic Monthly Press, 30 August 2011, ISBN 978-0802119926

Reviewed by Mr. Jeffrey L. Rosemann

In 1968, at the age of 23, Karl Marlantes was dropped into the highland jungle of Vietnam, an inexperienced lieutenant in command of a platoon of 40 Marines who would live or die by his decisions. Marlantes did well as a young leader, but the U.S. Marine Corps did not prepare him for his life away from the battlefield.

In *What It Is Like to Go to War*, Marlantes takes a deeply personal and candid look at what it is like to experience the ordeal of combat. He critically examines how we might better prepare our warriors for war, their life, and their service. Marlantes weaves riveting accounts of his combat experiences with thoughtful analysis, self-examination, and his readings—from Homer to the Mahabharata to Carl Jung. He makes it clear how poorly prepared our 19-year-old warriors are for the psychological and spiritual aspects of the journey.

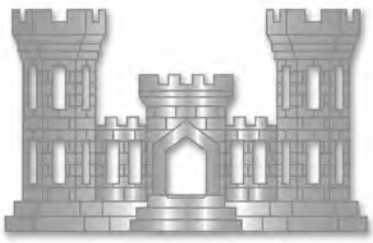
". . . Marlantes takes a deeply personal and candid look at what it is like to experience the ordeal of combat. He critically examines how we might better prepare our warriors for war, their life, and their service."

Marlantes describes the posttraumatic stress disorder that caused him trouble even after he had been home for years. Marlantes should be honored for his willingness to delve so deeply into his own experiences and share them with the reading public in stark, perfect detail, while hiding nothing. *What It Is Like to Go to War* was written as therapy by Marlantes to rid himself of his shadow. In many respects, it will help other young warriors begin to deal with their shadows as well.

He writes:

> Many will argue that there is nothing remotely spiritual in combat. Consider this. Mystical or religious experiences have four common components: constant awareness of one's own inevitable death, total focus on the present moment, the valuing of other people's lives above one's own, and being part of a larger religious community such as the *Sangha* "the community of Buddhists," *Ummah* "the Islamic nation," or church. All four of these exist in combat. The big difference is that the mystic sees heaven and the warrior sees hell. Whether combat is the dark side of the same version, or only something equivalent in intensity, I simply don't know. I do know that at the age of 15 I had a mystical experience that scared the hell out of me and both it and combat put me into a different relationship with ordinary life and eternity.
>
> Most of us, including me, would prefer to think of a sacred space as some light-filled wondrous place where we can feel good and find a way to shore up our psyches against death. We don't want to think that something as ugly and brutal as combat could be involved in any way with the spiritual. However, would any practicing Christian say that Calvary Hill was not a sacred space?

Mr. Rosemann is the technical director of the Department of Instruction, Directorate of Training and Leader Development, U.S. Army Engineer School, Fort Leonard Wood, Missouri.



Correlating Environmental Surveys for Contingency Operations

By Ms. Martha M. Miller

There are two important surveys that should be used as part of the base camp location selection process for contingency operations: the environmental baseline survey (EBS) and the occupational and environmental health site assessment (OEHSA). The EBS and OEHSA assessments include the following:

- An extensive review of current and past uses of the property projected for occupation.
- A site reconnaissance to identify environmental concerns that could pose health risks.
- The generation of data to confirm areas of impact or exposure points.
- The identification and/or quantification of contaminants of concern within the impacted areas or exposure points.

Personnel with environmental background and training conduct the EBS, while preventive medicine personnel conduct the OEHSA and assist with environmental sampling needed to complete the EBS. The surveys are generally conducted before establishing base camps, assembly areas, logistic sites, and internment camps. They document the existing environmental and health or safety conditions at the proposed sites. Conducting the surveys together is an efficient way to reduce redundancy and enhance communication. If it is not possible to complete the surveys as part of the site selection process, they should be completed within 30 days of occupation. If military personnel understand the impact that environmental and health threats can have on mission accomplishment and use this information as they plan, occupy, and close deployment sites, they will ensure force health protection, guarantee fiscal and material resource responsibility, reduce Army liability, and strengthen the relationship between the Army and the host nation.

The EBS complements the OEHSA, but each survey assesses a site from a different perspective:

- ***EBS.*** The EBS focuses on the impact of the Soldiers, mission, and occupation on the environment as a way to prevent and/or limit Soldier exposure to hazards, to document existing environmental issues for the purpose of force health protection, to reduce U.S. liability after operations are completed, and to determine the viability of the property as a base camp location to conduct the mission. Its purpose is focused specifically on contingency operations.
- ***OEHSA.*** The OEHSA identifies exposure pathways for real or potential occupational and environmental health hazards (chemical, biological, and radiological) that may affect the health of deployed personnel. The summation of exposure pathways is used to create a conceptual site model. The OEHSA has a wider application than just contingency operations. The information it generates informs the commander of occupational and environmental health threats and documents potential exposures for future analysis.

Environmental sampling may be required for both surveys. The EBS sampling determines the type and extent of existing environmental contamination, whereas the OEHSA sampling primarily focuses on how the site may affect the health of Soldiers during occupation. With proper coordination, the sampling for both surveys can be done at the same time. The EBS and OEHSA gather information such as site history and characteristics, existing man-made structures, water resources, waste management activities, wastewater treatment and disposal, existing active or abandoned industrial sites, and possible radioactive contamination. In addition, the EBS will identify the presence of natural resources, endangered species, historical or cultural properties, and agricultural implications for the area. Preventive medicine personnel may rely on the EBS for site description information, such as the following:

- Physical setting.
- Climate and weather.
- Topography.
- Ground and surface water.
- Soil types.
- Vegetation.
- Wetlands.
- Flood and coastal zones.
- On-site infrastructure, to include adjacent properties.

The OEHSA uses a conceptual site model to describe potential exposure pathways which serve as the basis for developing the site surveillance and analysis plan. Personnel will begin to develop the EBS and OEHSA reports during the predeployment phase as part of the preliminary hazard assessment by gathering information about the proposed base camp location from available information resources. Enough overlap exists between the surveys that each

benefits the other, but both are still necessary for their unique perspectives.

The execution of the EBS and OEHSA may be assigned to one or two people; or if manpower is available, it may be assigned to a squad level team. These individuals may be Soldiers (commissioned officer or enlisted), civilians, or both. Sometimes, U.S. Army Corps of Engineer assets are used to support the environmental mission. Regardless of what resources are used or how many personnel are assigned for effectiveness and time management, it is important to have a plan for using these resources before the ground reconnaissance is started. It is also important to ensure that the proper tools are available for conducting the survey. For the EBS, engineers should have an Instrument Set, Reconnaissance and Surveying (ENFIRE). The ENFIRE kit has the necessary survey tools in one container, including a—

- Laptop computer.
- Digital camera.
- Global positioning system.
- Range finder.

If an ENFIRE kit is not available, the listed tools are the minimum needed to record the results of the ground reconnaissance.

The beginning step of any military action is to perform a risk assessment.[1, 2] The risk assessment of an area being considered for occupation is an essential tool to identify potential hazards and focus survey resources. Leaders manage risk by evaluating hazards and implementing controls continuously throughout the course of the mission. A risk assessment identifies areas that should be more thoroughly investigated. The EBS and OEHSA will identify hazards at proposed base camp sites and determine the need for controls to protect force health and prevent future liability. Any contaminated areas that are not documented during the survey may become a liability to the United States once operations cease. Through the risk assessment, personnel can develop a design for the actual EBS and/or OEHSA, to include a preliminary sampling plan that will target areas identified during the assessment.

Figure 1 outlines the EBS and OEHSA processes and diagrams where the systems overlap. Both require

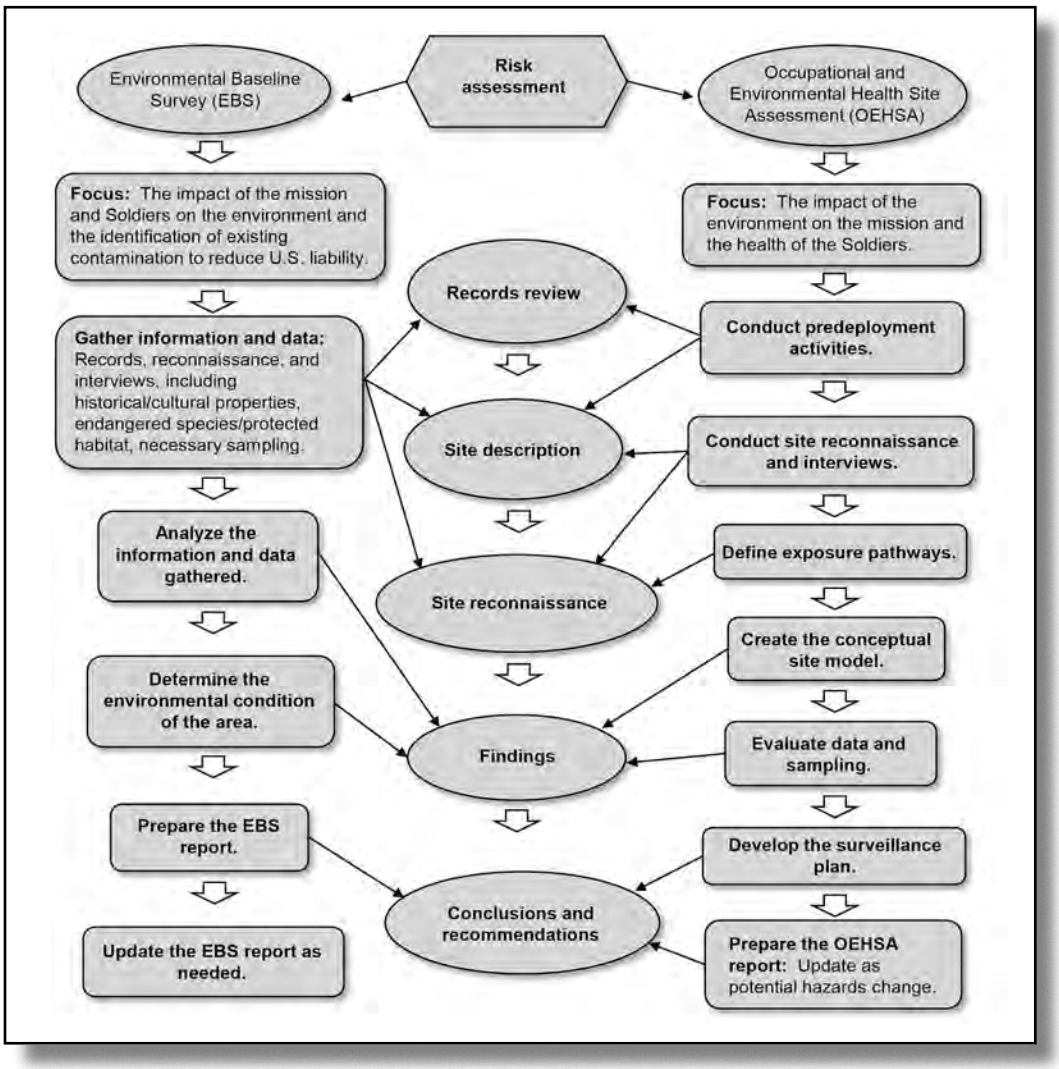


Figure 1. EBS and OESHA process flow chart

gathering background and historical information from all available sources, including—

- Government documents and data repositories.
- Internet searches.
- Previous military and civilian occupants.
- Maps.
- Satellite imagery.
- Military databases, such as the Defense Occupational and Environmental Health Readiness System and the Military Exposure Surveillance Library.
- Intelligence reports.
- Site records and history, to include deeds, property descriptions, and previous environmental or health studies and reports.
- Interviews with local officials and current occupants of the vicinity.

The EBS and OEHSA require a physical site reconnaissance to verify the information gathered and to document hazards that have not previously been documented. Interviews with local nationals are an important part of the site reconnaissance because occupants will have the best knowledge of a location. Both surveys require a thorough documentation of the site reconnaissance, to include—

- A complete site description.
- Photographs.
- Charts, maps, and drawings.
- The documentation of existing infrastructure and building materials.
- The depiction of hazards identified.
- Waste management activities.
- A list of disease vectors and pest management.
- Industrial activities and hazmat present.
- Water resources.

The ground reconnaissance will identify areas of possible contamination that need to be sampled. Everything investigated as part of the EBS and OEHSA for the proposed base camp location must also be investigated for all adjacent property. Industrial, agricultural, or other activities on adjacent properties that could cause ground and groundwater contamination could be a concern for the proposed occupation site. The presence of such activities would help guide the sampling plan for the proposed site. Reports and recommendations for the EBS and OEHSA cannot be finalized until all sampling results have been received and analyzed.

Once the information is gathered, it must be analyzed for findings that will be the basis to draw conclusions and make recommendations to commanders about the use of the proposed location. If there are measures or controls that can be emplaced to mitigate identified hazards, they will also be developed and presented. Current, completed OEHSAs are entered and stored electronically in the Defense Occupational and Environmental Health Readiness System database developed by the U.S. Army Public Health Command. Older reports are archived in the Military Exposure Surveillance Library. At present, there is no permanent storage database for EBS reports. Finalized EBS reports must be submitted through the chain of command to the affected combatant command, maintained by the occupying unit or activity, and provided to follow-on forces before redeployment. It is recommended that the finalized reports be submitted to the Military Exposure Surveillance Library to be archived.

If qualified personnel are not available to complete the EBS during contingency operations, a training support package can be requested from the U.S. Army Engineer School, Directorate of Environmental Integration, at <usarmy.leonard wood.engineer-schl.mbx.dei@mail.mil>.[3] The *Environmental Surveys Handbook: Contingency Operations (Overseas) 2013* contains a checklist to gather EBS information and the format used to document the report.[4] Both documents were correlated with the OEHSA template when they were developed. (The EBS checklist and report format are in the process of being converted to Department of Defense forms.) Refer to Army Techniques Publication 4-02.82, *Occupational and Environmental Health Site Assessment*, for guidance on how to complete the OEHSA.[5] The template for the OEHSA and the exposure pathway form, with instructions for completion, are available at <https://mesl.apgea.army.mil/mesl /doehrsResources/initialize.do>.

Endnotes:

[1]Army Techniques Publication 5-19, *Risk Management,* 14 April 2014.

[2]Field Manual 3-34.5, *Environmental Considerations,* 16 February 2010.

[3]Training Support Package 052-E-0040, *Conduct an Environmental Baseline Survey During Contingency Operations*, 1 February 2008.

[4]*Environmental Surveys Handbook: Contingency Operations (Overseas)*, August 2013, <https://www.us.army.mil/suite /doc/41860801>, accessed on 15 April 2014.

[5]Army Techniques Publication 4-02.82, *Occupational and Environmental Health Site Assessment*, April 2012, <http:// static.e-publishing.af.mil/production/1/af_sg/publication /afttp3-2.82/afttp3-2.82.pdf>, accessed on 15 April 2014.

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BUILDING THE BRIGADE ENGINEER BATTALION

By Lieutenant Colonel Andrew N. Liffring and Major Brian M. Southard

On 15 November 2013 at Fort Bragg, North Carolina, a ceremony celebrated the contributions of the 2d Brigade Special Troops Battalion as it was deactivated. The ceremony also welcomed the 37th Engineer Battalion as it was officially reactivated as a brigade engineer battalion (BEB). The ceremony signaled the beginning of the Army's transformation to Brigade Combat Team (BCT) 2020. In this transformation, brigade special troops battalions will become BEBs and receive an additional engineer company and a forward support company (FSC) while the staff will receive additional engineers. This transformation will give the BCT the capability to conduct everything from combat engineering to route clearance, bridging, and horizontal and vertical construction. Although this transformation is the right thing to do, it will not happen overnight. Detailed planning must happen at the division, brigade, and battalion levels to synchronize the activation of the BEBs with the Army force generation process.

The 37th BEB began detailed planning immediately after receiving official notification. Initial planning consisted of designing a strategy to man, equip, and train the new battalion in time to take advantage of an intensive division training cycle that was scheduled to begin on 1 June 2014. Additional challenges that the battalion faced were the fielding of new communications gear and the brigade transition to the new T-11 parachute.

The battalion commander and executive officer designed a strategy based on four lines of effort:

- Personnel.
- Equipment.
- Training.
- Facilities.

Each line of effort had specific decisive points that were linked in time and space.

Personnel. This line of effort was designed to ensure that the battalion was ready to enter the train/ready force pool of Army force generation within 225 days. To meet this objective, the 37th BEB needed to fill personnel shortages; add a second engineer company and an FSC; transfer a military police platoon to the 16th Military Police Brigade; and change commanders in the headquarters, signal, and military intelligence companies.

To fill personnel shortages, the 82d Airborne Division worked with the U.S. Army Human Resources Command to develop a course of action that transferred the officers and Soldiers of the 137th Engineer Company to the 2d Brigade Combat Team to form the nucleus of Company B, 37th BEB. The Soldiers that were needed to fill positions in the newly formed FSC were slotted against the support platoon of the 2d Brigade Special Troops Battalion. Officers from the 407th Forward Support Battalion were designated to fill key leadership roles in the FSC.

Although simple in concept, the integration of the new Soldiers had to be managed to ensure that readiness was maintained. The 37th BEB set up a 7-day integration plan that included briefings by the commander and command sergeant major on standards and expectations, verification of Department of Defense Form 93 and Servicemembers' Group Life Insurance information, and medical examinations of Soldiers to ensure that they were medically fit.[1, 2] The in-processing culminated with the battalion commander and command sergeant major hosting a town hall meeting with Families to welcome them to the battalion.

A less visible part of the transformation process involved moving the military police Soldiers assigned to Headquarters and Headquarters Company, 2d Brigade Special Troops Battalion, to the 16th Military Police Brigade. Soldiers who were not on orders in the next 180 days or who were nondeployable were transferred to the 16th Military Police Brigade as individual augmentees. Before leaving the battalion, a special deactivation ceremony was held to express gratitude for their service.

The 37th was successful in filling personnel shortages only because of the relationships built between the teams

involved. Early in the process, the battalion hosted the leaders of the 407th Brigade Support Battalion and 307th Engineer Battalion to find common ground, discuss issues, and develop a synchronized plan. What resulted was increased communication, information sharing, and an early start to developing the 37th BEB team.

Equipment. The 82d Airborne Division had the unique challenge of building three BEBs while deactivating the 4th BCT. Due to mission requirements, priority went to the 127th Engineer Battalion, 1st Brigade, followed by the 37th BEB, 2d Brigade and, finally, to the 307th Engineer Battalion, 3d Brigade.

Equipping the 37th BEB was a major concern that proved to be a difficult task. The battalion executive officer and supply officer closely monitored lateral transfers inside the battalion while engaging the brigade property book officer with recommendations for lateral transfers. Company changes of command were synchronized with the activation of the FSC and Company B to ensure that property accountability was maintained and training time was maximized.

Training. During the transformation process, the battalion never took its focus away from training. The battalion issued quarterly training guidance to subordinate companies focusing their training at the individual, section, and squad levels. The battalion created guidance for Headquarters and Headquarters Company; Company B; and the FSC, although they had not officially formed as units. This guidance allowed the future company commanders to develop and resource training for the spring of 2014.

To maintain staff proficiency, the quarterly training guidance incorporated quarterly staff exercises. The exercises, which focused on airfield seizure with special emphasis on runway repair and defensive operations, required staff members to reevaluate how they integrated with the brigade engineer and other battalions to create the effects the brigade needed. It also forced the battalion staff to create the staff products they would need to serve as a BEB headquarters.

To ensure that the battalion was ready to start training with the brigade in June 2014, the battalion planned a 2-week exercise to train and certify squads. The exercise provided a point of synchronization where all lines of effort had to meet to be successful.

Facilities. Finding the facilities needed to support the transformation of the 37th BEB was the most complicated part of the transformation process. Digital connectivity and space for company headquarters, supply and arms rooms, and motor pools were some of the issues that the battalion faced. Due to the complexity of providing the necessary facilities, planning involved elements from the company level to the installation level, with most of the planning being performed at the installation, division, and brigade levels. In the end, the 37th BEB had to move motor pools, seven company headquarters, and the battalion headquarters, synchronizing the movements with the activation of the FSC and new Company B, 37th BEB.

Critical to the activation of the FSC was allocating a secure arms room, supply room, and company headquarters. Fortunately, the battalion was able to colocate Headquarters and Headquarters Company and the FSC in the same building, which made space available for supply rooms and operations sections. The brigade support battalion allocated space in an arms vault to allow FSC Soldiers to store their weapons. Once these facilities were identified, the FSC started planning change-of-command inventories.

"This transformation will give the BCT the capability to conduct everything from combat engineering to route clearance, bridging, and horizontal and vertical construction."

The creation of the second engineer company was more complex. Facilities were not available, requiring the new Company B to occupy facilities on the opposite side of Fort Bragg. To support the split-based operations, the FSC provided Company B with a maintenance support team, a Standard Army Maintenance System operator, and a Standard Army Maintenance System–Enhanced box with satellite communications capability. In the early stages, this was difficult since the FSC was only 60 percent manned. Services had to be prioritized, and additional maintenance support was required from the 407th Brigade Support Battalion to meet the demand. In the end, a plan was developed that allowed the 37th BEB to occupy the necessary facilities, completing the transformation process in 360 days.

Summary. Transformation does not happen overnight and involves detailed planning at the division, brigade, and battalion levels to synchronize the critical tasks needed to transform a special troops battalion into a BEB. As the Army continues to develop the BEBs, leaders will see the desired effects and capabilities emerge.

Endnotes:

[1]Department of Defense Form 93, *Record of Emergency Data*, January 2008.

[2]SGLV 8286, *Servicemembers' Group Life Insurance Election and Certificate*, April 2013.

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