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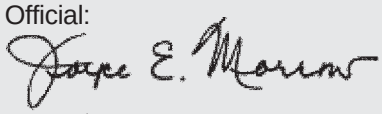

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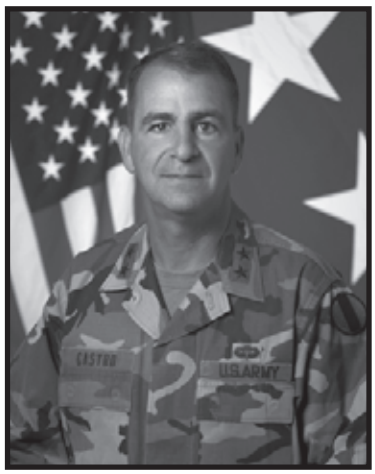
DEPARTMENTS

FEATURES

Clear The Way

By Major General Randal R. Castro
Commandant, United States Army Engineer School



Welcome to our Spring issue of *Engineer*. The focus is *One Engineer Regiment—Transforming and Assuring Mobility While at War,* the same theme planned for ENFORCE from 1-5 May 2006. If you make no other plans this year, you need to take advantage of this opportunity for a week filled with dynamic speakers who will share their recent experiences on what engineers are accomplishing in the AOR, at USACE, and in industry. The week will begin in St. Louis and culminate at Fort Leonard Wood with the Regimental Review and Ball. In addition, we will celebrate the successes of engineers throughout the year, to include honoring participants in the Best Sapper Competition.

Our priority remains supporting the Global War on Terrorism and developing innovative solutions to capability gaps, especially with respect to IED defeat. Although there is no silver bullet for eliminating the IED threat, I believe there is a "Silver Path." This path consists of multiple solution sets that, when integrated, can enable our forces to successfully predict, detect, exploit, and neutralize IEDs, while mitigating IED effects and protecting our forces. The IED-defeat ICDT, located at Fort Leonard Wood, is prepared to assist deploying BCTs and sappers with the requisite **skills** and **tools** to conduct mission-focused training in preparation for OIF/OEF.

In March, the 3/2 SBCT completed its mission rehearsal exercise at NTC, integrating the available **skills** and **tools** currently on the Silver Path. Prior to the rotation, 3/2 SBCT received contingency training, including IED-defeat T3, advanced search, route reconnaissance and clearance, robotics, UAV operations, counter-RCIED (remote-controlled improvised explosive device) electronic warfare (CREW), and battle command. Many of the **tools** used for training that accompanied 3/2 SBCT to NTC will follow into theater…including advanced search kits, explosive detection kits, and robotics platforms. As continued materiel capabilities and TTP develop, our team is working to better enable BCTs and deploying units to "train as you fight" prior to deployment.

A key to our success in theater has been our Counter Explosive Hazards Center (CEHC)—our Regiment's "Center of Excellence" for countering explosive hazards—which is fully engaged in the effort to defeat IEDs. CEHC is your resource for lessons learned, countermeasures, intelligence, materiel solutions, and training. When a new training requirement is identified, CEHC can rapidly develop contingency training to close the gap and prepare sappers for combat. In the past few months, CEHC has trained many Army and Marine units in IED-defeat awareness, route reconnaissance and clearance, advanced search, area clearance, equipment maintenance, and integration of the latest lessons learned from the CENTCOM AOR.

CEHC led several initiatives to increase the capabilities of route reconnaissance and clearance teams, including operational testing of the GYROCAM, prototype integration and testing for the CROWS, and prototype testing for the Buffalo RPG cage. We are working to provide route clearance teams and sapper companies with an enhanced capability to investigate potential IEDs using cameras and a mechanical arm to sort through roadside debris. All this has helped reduce engineer casualties in theater. We will continue our efforts!

No one is surprised when I say that the Regiment is multitasking as we deploy, transform, and restation units throughout the force. Our young company commanders and first sergeants are making things happen at the lower level, while battalion commanders and command sergeants major work the higher-level challenges. A success story is the recent activations of the 19th and 20th Engineer Battalions, at Fort Knox and Fort Hood respectively. With the help of DA, FORSCOM, USACE, and the Engineer School, these units have overcome many challenges and are slowly building combat power in preparation for future operations. Great job! In October, we will stand up four more engineer battalions…yes, *four more*!

I want to thank our Regiment's leaders for submitting their Itschner, Van Autreve, Sturgis, and Grizzly award nominations. The books are being reviewed, and the winners will be announced at the Regimental Ball. The books this year were all exceptional and represented the *Essayons* spirit across our Regiment.

I appreciate our commanders and command sergeants major who supported this year's Best Sapper Competition. It is a tremendous opportunity for our junior leaders to represent their units and the force. We will recognize all these Soldiers and present the Lieutenant General Robert B. Flowers bust to the winners.

Lastly, and most importantly, I want to extend a special thanks to all the great engineer officers, NCOs, and Soldiers across the force. Remember that your contribution to the war is not measured by your proximity to direct fire but by what you provide to the success of our Soldiers, our Army, and our Nation in this time of war. Whether you are the Buffalo operator on a route clearance mission in theater, or the instructor teaching clearance operations to deploying Soldiers at Fort Leonard Wood, you are all contributing to the fight, and we are indebted to you for all you do. Be safe, and see you next issue!

Carry On!

Lead The Way

By Command Sergeant Major Clinton J. Pearson
United States Army Engineer School

Greetings to all from Fort Leonard Wood, Missouri, home of the engineers, where training, transformation, and taking care of our leaders and Soldiers are our top priorities! There are extraordinary events taking place in our Regiment every day, and one of the most important of the year is quickly approaching—ENFORCE 2006.

The beginning of ENFORCE 2006 will take place in St. Louis, from 1-3 May 2006, and the conclusion will be at Fort Leonard Wood, from 4-5 May 2006. The theme for the activities will be *One Engineer Regiment—Transforming and Assuring Mobility While at War.* I am looking forward to seeing many of you at this year's events. We have a great week planned, starting with the Council of Colonels/Command Sergeants Major. We need your input and experience as we discuss the issues our Regiment is currently facing while we transform and assure mobility in the Global War on Terrorism.

A great lineup of guest speakers is scheduled this year, to include representatives from the Assistant Chief of Staff, Personnel (G1); the Human Resources Command (HRC); the Gulf Region Division (GRD); the National Training Center (NTC); and the United States Army Engineer School. One of the subjects we'll discuss is the issues facing embedded engineers in the Heavy Brigade Combat Teams (HBCTs). Our sister services will also speak and provide updates that will bridge the gap between engineer capabilities in all services as our armed forces move into a new era of joint operations. Keeping with tradition, we'll have the Army Engineer Association Presidential Dinner, the Regimental Ball, the Engineer Memorial Dedication Service, and the Regimental Review. The second annual Best Sapper Competition will take place, coinciding with ENFORCE for the first time. So select and train your best teams for this extraordinary competition! Finally, the Regiment's leaders will host a dedication ceremony in honor of Sergeant First Class Paul Ray Smith, an engineer who was posthumously awarded the first Medal of Honor for actions in support of Operation Iraqi Freedom. To sum it up, ENFORCE 2006 will undoubtedly instill in each of us an immense pride in our Regiment.

I also felt a tremendous sense of pride at two recent activation ceremonies for the 19th Engineer Battalion at Fort Knox, Kentucky, and the 20th Engineer Battalion at Fort Hood, Texas. These ceremonies are a testament that the modular engineer force is taking shape. In March 2006, the 1st Engineer Battalion from Fort Riley, Kansas, converted to a modular engineer battalion headquarters. The 70th Engineer Battalion, at Fort Carson, Colorado; the 864th and the 14th Engineer Battalions at Fort Lewis, Washington; and the 5th Engineer Battalion, at Fort Leonard Wood, will convert in the near future.

Many units will relocate in the upcoming months as well. As you may already know, the 50th Multirole Bridge Company (MRBC) moved to Fort Leonard Wood in 2005. On the horizon, the 94th Engineer Battalion will relocate to Fort Leonard Wood; and as part of a Base Realignment and Closure (BRAC) decision, the 36th Engineer Group, now at Fort Benning, Georgia, will relocate to Fort Hood this summer and transform to a modular engineer brigade.

One of the major concerns of transformation is training the embedded engineers in the HBCT. We must provide them with the necessary **skills** and **tools** to enable the combatant commander to ensure mobility in concert with maneuver. To assist us in this process, the Engineer School has implemented several functional courses, including the Military Search Operations Course, the Route Reconnaissance/Clearance Operations Course (R2C2), the Route Reconnaissance/Clearance Operations Course – Sapper (R2C2-S), the Route Clearance Equipment (RCE) Maintainer Course, the Area Clearance Course, the Improvised Explosive Device Defeat – Train the Trainer (IEDD-T3) Course, and the Improvised Explosive Device Defeat – Train the Trainer (IEDD-T3) Mobile Training Team (MTT) Course. Currently, these courses are all non-Army Training Requirements and Resources System (ATRRS), contingency-based training. For more information on these courses, visit the Counter Explosive Hazards Center (CEHC) Web site at <*http://www.wood.army.mil/cehc*>.

Two other courses that remain significantly important are the joint Urban Mobility Breaching Course (UMBC) at Camp LeJeune, North Carolina, which has greatly improved the sapper's ability to fight and win in an urban environment; and the Explosive Ordnance Clearance Agent (EOCA) Course, at Redstone Arsenal, Alabama, which provides the basic skills and knowledge required to perform as explosive ordnance clearance agents.

All of these courses are relevant to the current and future fight; however, I ask that the leadership continue to support the Basic Noncommissioned Officer Course (BNCOC) and the Advanced Noncommissioned Officer Course (ANCOC). Both courses are extremely important to the career progression of noncommissioned officers and greatly enhance their ability to perform their wartime mission.

In closing, I'd like to welcome back those Soldiers who have recently returned from a deployment. And to those who have recently departed, I wish a safe and speedy return home. God bless the fallen comrades and their families. We will never forget you.

Heros
With Bulldozers

By Mr. Ralph Peters

America's soldiers are always good for a surprise: The enthusiasm the Army's combat engineers show for our mission in Iraq would dumbfound even our military's most fervent supporters.

Privileged to speak with officers and NCOs from the Army's Maneuver Support Center in Missouri last week, I came away proud to have worn the same uniform as those men and women. Every one of them had served in Iraq or Afghanistan. Now they were briefly back home, working hard to incorporate combat lessons-learned into doctrine and training the young soldiers they'll lead during their next Mideast tours.

All that nonsense about a "broken Army"? What I heard was the conviction that we're not only doing the right thing in Iraq, but doing it far better than the media tell the American people.

Along with those combat engineers, the audience consisted of infantry, military police and chemical corps leaders—veterans all. Not one was discouraged by the political tempests blowing in Washington (where the hot air is a prime cause of global warming). The best word for what our soldiers displayed is *zeal*.

I only wish my fellow citizens were given an honest view of our troops, their morale and their accomplishments—along with a fuller sense of our military's complexity. Yes, the infantry leads the way, along with the other combat arms. But who hears about the combat engineers? Even though they often *lead* the infantry?

Well, here's to the heroes who clear the minefields, defuse the improvised explosive devices (IEDs), blow open the doors, dig the trenches, build the defensive barriers, renovate the schools and clinics, plunge into the tangle of wires that passes for an electrical grid—*and* fight as infantrymen when the need arises.

When you see those dramatic photographs of infantry teams taking down an urban target, the soldiers *up front* are often combat engineers, opening a path for the grunts to go in.

Every branch of our Army makes its own unsung contributions, but a glimpse at the combat engineers offers a sense of how complex the Iraq mission really is—and how bravely those in uniform have faced up to the challenges. So here are a few anecdotes from the officers and NCOs I met last week:

- All a soldier has to do to make headlines is to whine to a reporter. But we don't hear about the NCO lying in a stateside hospital ward who, after losing an eye defusing an IED, begged his visiting commander to help him get back to his unit in Iraq.
- In the past, active-duty leaders often dismissed the National Guard as "weekend warriors." Not anymore. The highest praise I heard was for a "dump-truck" outfit, the 1457th Engineer Battalion from the Utah National Guard, that served in Baghdad and central Iraq. A colonel described them as remarkably brave and resourceful. Operating at as low as 65 percent of their authorized strength, those mountain lions from the Rockies never ducked a high-risk mission—whether they'd been trained for it or not.
- When the highly paid contractors failed to show up with the bullets flying, combat engineers often were thrown in to get the electricity working out in the boonies. And they did. But all we heard about were the problems in Baghdad — where the contractors were responsible.
- Having just returned from Iraq, one officer said, "I'd give up my promotion to go back." Even allowing for the moment's enthusiasm, that family man *believed* that his sacrifices made a vital difference. Why don't men like him make the evening news?
- Even during an occupation, the Army has to train for its full range of missions. At a division commander's request, our engineers built a tank-gunnery range with 64 *miles* of protective berms to keep the main-gun rounds from going astray. One example among many—all in a day's work for the bulldozer boys.
- That day's work includes some of the most dangerous missions in Iraq—defusing IEDs. The equipment and techniques have gotten better, but it remains a nerve-wracking challenge. Combat engineers *volunteer* to do it.
- As in the Army's better-known units, our combat engineers see impressive *re*-enlistment rates. Soldiers sign up knowing they'll be sent back to Iraq. Tough as it is, they love what they do. As one command sergeant major put it, "This is what they signed up for, this is what it's all about."

Of course, no list of this sort can begin to capture the courage of these soldiers. They have families they love and the prospect of long lives in the greatest country on earth. Yet, they continue to risk death or mutilation because they will not quit on America—or Iraq—in the middle of a war.

At a time when we're bombarded with so much doom-and-gloom nonsense from those who'd like to abandon the world to terrorists, it's a shame we don't hear more about the men and women who *stay* in uniform, who do our nation's toughest work and receive so little credit from the know-it-alls safe at home.

Harvard and Yale? Keep 'em. The finest Americans are those who have gone through the School of the Soldier. A "broken military"? Nope. Anyway, if it was broken, the combat engineers would fix it. Under fire.

Mr. Peters, a retired Army intelligence officer, has published and lectured extensively on military and international concerns. His latest book is "New Glory: Expanding America's Global Supremacy."

This article is a reprint from the January 20, 2006, New York Post.

FUSION CELL

By Sergeant First Class Christopher T. Sanson

The Fusion Cell is the United States Army Engineer School answer to the requirement for a central coordination cell to bring together the people who can answer the multitude of questions so often heard throughout the Engineer Regiment in these fast-moving times. *"When are we doing our base realignment and closure (BRAC) move?" "When are we deploying to support Operation Iraqi Freedom?" "When are we transforming to the Future Engineer Force modular design?" "Which modular design are we transforming to?" "Where do we send our equipment?" "How are we getting our new equipment?"* These and hundreds of other questions need to be answered, and often the answers are not readily apparent or even finalized.

Purpose

The Fusion Cell's mission is to gather and present data on the current state of engineer transformation, restationing, and support to the Global War on Terrorism (GWOT). It is not, in itself, responsible for correcting problems and issues; its role is to assist in issue identification, facilitate communication, and assist in issue resolution.

The Fusion Cell was born from the need to synchronize the Regiment's actions as it sails ahead, with three major waves (significant actions) surging together like the proverbial "perfect storm" and threatening to sink the ship of progress:

- Global repositioning and BRAC.
- Deployment in support of the GWOT.
- Transformation to the modular Regiment.

In September 2005, the Cell was formed as a means of synchronizing and deconflicting these potentially counteracting requirements. It is possible to have a situation where an engineer unit is identified to relocate to the continental United States (CONUS) as part of global repositioning, transform into the modular force or stand up as a new unit, and deploy in support of GWOT within the same calendar year. However, it is not feasible to expect a unit to undergo such significant change within the same year, so one of the most critical functions of the Fusion Cell has been to work with the Department of the Army (DA) to modify the timing of basings, force structure changes, or GWOT rotations. The senior engineer leaders are aggressively engaging the DA staff to synchronize challenges and maximize the abilities of units to manage the rate of change in a given year. Ensuring that this happens is a massive undertaking, and to accomplish it requires communication with numerous organizations, including the installation, the United States Army Forces Command (FORSCOM), DA, and others.

Challenges

Working primarily with Active Army FEF units outside the brigade combat teams, many challenges and recurring issues arise. The biggest challenge is getting the personnel and equipment to the unit with sufficient time remaining to conduct the required training in preparation for a GWOT deployment. Time is the biggest hurdle since many tasks are being done concurrently.

Activating a unit from scratch is a very challenging task, especially for the unit's commander and staff. Once the United States Army Human Resources Command (HRC) identifies the personnel for the unit, the key personnel must hit the ground running and set the foundation for the rest of the unit to arrive. A key issue is that HRC assigns personnel to the installations. Units that will be next in line on their installation to deploy must work with their installation to ensure that they receive the inbound personnel who have the required military occupational specialties (MOSs), particularly if there are other engineer units on that installation.

The task of securing the motor pools, barracks, and orderly rooms may or may not be an easy one, depending on the facilities available on the installation. Lessons learned show that an early and thorough scrub of the end-state modified table of organization and equipment (MTOE) is key to ensuring

unit identification code (UIC) allows the unit to receive personnel, equipment, and funding from their major command. However, *no* funding solely intended for transformation is being issued to units. Newly activated units are given operational funds like every other unit in the Army, and no more.

An engineer higher headquarters will not necessarily reside on the same installation to provide support to the activating unit. A key event is assigning a parent unit to facilitate the unit's activation. In the future, parent units will provide guidance from the experiences of units that have already activated or transformed into the same type of unit. The goal should be that the personnel arrive at the activating unit in time to operate and maintain the equipment as it arrives. Often, many of the items needed are on another installation and require coordination for movement.

A converting unit may have some of the same issues but normally will have an easier time if it remains on the same installation, because some of the personnel and equipment are retained when the unit transforms. Again, completing an early scrub of the MTOE is a key factor in doing this successfully. Based on the master plan for the installation and the transformation of its units, individual units may have to move somewhere else on the installation, but the support structure will remain intact. Any excess equipment will be identified and sent where it is needed.

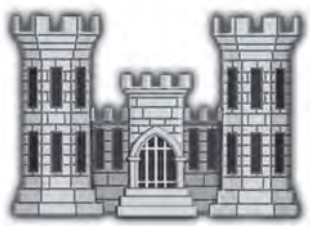
Summary

These are only some of the most prevalent issues discussed in Fusion Cell sessions. These sessions will continue for an indefinite time into the future. The hard work of the Office of the Chief of Engineers (OCE); HRC; FORSCOM; United States Army Tank-Automotive and Armaments Command (TACOM); DA Assistant Chief of Staff, Operations and Plans (G-3) and Assistant Chief of Staff, Finance (G-8) staffs; and many others—as participants in Cell sessions and members of the team—have provided an outstanding forum in which to solve problems and conflicts. Many engineer units will ride at least one of the waves of the perfect storm in the same year, but will be able to have a helping hand along the way.

Units are encouraged to use the weekly session to help prepare their plans, using the lessons learned and issues discussed by other units that are activating, converting, or rebasing. Useful information has been posted to an Army Knowledge Online (AKO) site. Contact the Fusion Cell noncommissioned officer in charge at <*Christopher.sanson@us.army.mil*> or the link provided on the USAES home page for any questions or for access to the files.

Sergeant First Class Sanson is the noncommissioned officer in charge of the United States Army Engineer School Fusion Cell.

The Engineer Castle



The appropriateness of the turreted castle as a symbol of the Army Corps of Engineers is readily apparent. The medieval castle is inseparably connected with fortifications and architecture. In heraldry, the castle and the tower are often used on coats of arms or given as charges in the shield of individuals who overcame walled fortifications, were the first to mount their walls, or successfully defended them. In this country, the term "castle" has been applied to the strongest of our early fortifications, such as Castle Pickney in Charleston, South Carolina, and Castle Williams and Clinton in New York Harbor.

The castle is a highly stylized form without decoration or embellishment. The Army officially adopted the castle to appear on the Corps of Engineers epaulets and belt plate in 1840. Soon afterward, the cadets at West Point—all of whom were part of the Corps of Engineers until the Military Academy left the charge of the Chief of Engineers and came under the charge of the Army at Large in 1866—also wore the castle on their cap beginning in 1841. Subsequently, the castle appeared on the shoulder knot, on the saddle cloth, as a collar device, and on the buttons. Although its design has changed many times since its inception, the castle has remained the distinctive symbol of the Corps of Engineers.

Building an Airplane While It's Flying

Interim Lessons Learned on Activating a Battalion Already Slated to Deploy

By Lieutenant Colonel Courtney W. Paul and Major Jason S. Denney

A popular advertisement of Electronic Data Systems Corporation refers to the challenges of "building an airplane while it's flying." Standing up an engineer battalion from scratch, that is on a planning deployment document the day it activates, can be as difficult a challenge. What follows is one version of what faces a commander and his staff when starting a unit and building it from the ground up, as well as some suggestions on a plan of action and issues to be aware of. Department of the Army (DA), major commands, and installation staff officers may read this article and see where their actions can impact and influence future activations of the Engineer Regiment in a positive manner.

Standing Up the Battalion

So you've just gotten the telephone call and are a bit incredulous that a few individuals and a couple of borrowed computers setting on Defense Reutilization and Marketing Office furniture in a transient office building are all that exist of the proud battalion depicted in your modified table of organization and equipment (MTOE). What next? The following steps will help you get started in the right direction:

Assess Your Situation

As you activate, find out when and where you are to deploy. Old standards of having up to a year of protected C-5 reporting status on the unit status report (USR) are gone, and you will have to continually explain that fact to individuals in agencies you deal with. The following validated assumptions will help you assess the picture:

- The priority on personnel, equipment, and funding is directly proportional to the amount of time before deployment. And if you find yourself with 20 months available before deployment rather than less than a year, many of these concerns will still be valid.
- Know when DA and the United States Army Forces Command (FORSCOM) will be building your force structure for your deployment, and make sure you can convey the complete story when it is ready to be heard and acted upon.
- Personnel fill will be from the top and the bottom, which means you'll have a couple of field grade officers and senior noncommissioned officers and a graduating class of advanced individual training (AIT) students.
- Equipment fill is a laborious process. Assess getting training sets from a variety of sources, and then accept that drawing equipment in theater is a likely consequence.
- The standard resourcing model is to give you your operations and maintenance allotment for the year. This is not enough to stand up the unit, but everything else will have to be treated like an unfinanced requirement (UFR) request.

Meet People

Identify all of the organizations you may have to deal with and who can make things happen for you. Depending on your command and control arrangement, your higher headquarters staff may suffice. In some cases it won't, particularly if your command and control arrangement is based on geography and not mission and your unit and your higher headquarters have widely divergent missions. The garrison/installation staff will likely have a wide and compartmentalized staff. You will need to personally meet with them to impress the urgency of standing up the unit and to give them a face for who needs help.

Develop a Training Plan

After assessing where your unit stands, develop a training plan that takes into consideration your personnel gains and your equipment training set availability. Accept that the unit will not be able to do much training until you get the right mix of key personnel and about 20 to 25 percent strength on the ground. With less than a year to deploy, the 19th Engineer Battalion used a plan that focused first on establishing battalion systems, and then in the second quarter used a "warrior phase" that focused on the warrior tasks, medical training, individual schools, and squad situational training exercises. Only in the third quarter was the unit able to focus on engineer-specific and collective tasks above platoon level.

As you establish this plan, you will continually have to assess your training plan against the personnel gains.

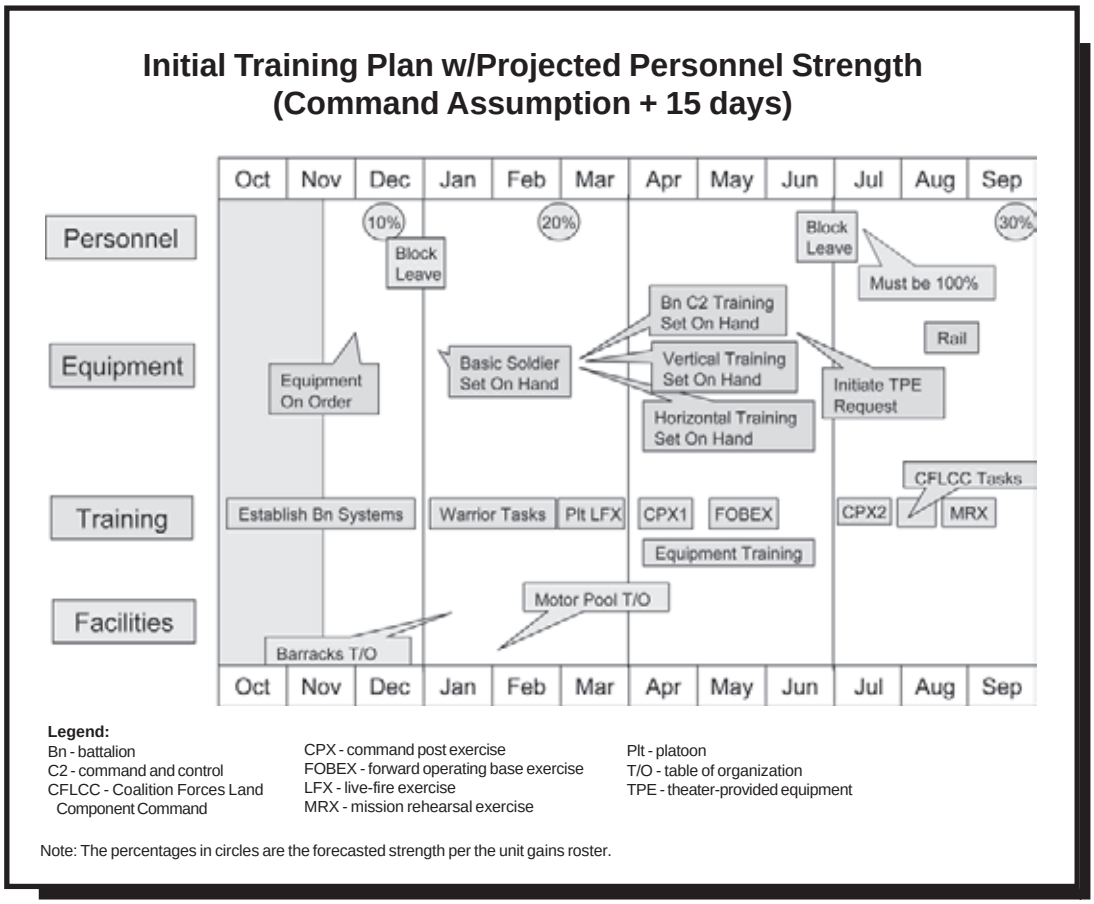


Figure 1

Unfortunately, the gains roster proves to be only an approximation of who is coming in and really doesn't become accurate until about 2 to 3 months out. Figure 1 shows an example of what that initial training plan might look like. A comparison to Figure 2 shows the difficulty of using the gains roster as a forecasting tool.

Reassess and Report

Continually assess your unit based on its go-to-war standard. Report your status through vehicles like the weekly commander's situational report and USR. Work through your higher headquarters to establish a series of in-progress review meetings to get visibility on your situation and to facilitate vertical and horizontal synchronization among the higher-echelon staffs.

Accept that the Army and FORSCOM staffs' center of gravity is focused on the transformation of brigade combat teams (BCTs), so your reports will have to address the level of urgency that otherwise gets lost in the background noise. The United States Army Engineer School Fusion Cell video teleconferences (VTCs) (see article on page 5) were another great forum for reporting status. While not an official function of the Engineer School, this weekly VTC proved to be the best location to raise issues and simultaneously see the coordination between staffs and functional areas. As this goes on, continue to fight for resources as you train. Use your training plan to trigger "redlines" (key dates where you have to have certain resources or a readiness shortfall occurs) and report them through every vehicle you get.

Be Ready

Be ready to react to all sorts of unforeseen issues with standing up; this airplane you are building is not on autopilot.

Challenges

Following are some of the challenges the 19th Engineer Battalion encountered. They are shared in the interest of allowing new units to avoid them or equipping staffs with some insights of what may lay ahead.

School Training

Scheduling classes and filling with the right military occupational specialty (MOS)-qualified Soldiers is a challenge. Availability of the basic courses needed to operate a battalion may be an issue based on location (see *location, location, location* on page 10).

Many mobile training teams (MTTs) will not travel to locations that cannot generate a BCT's worth of training slots. It is not that they are unwilling; it is that generally they are

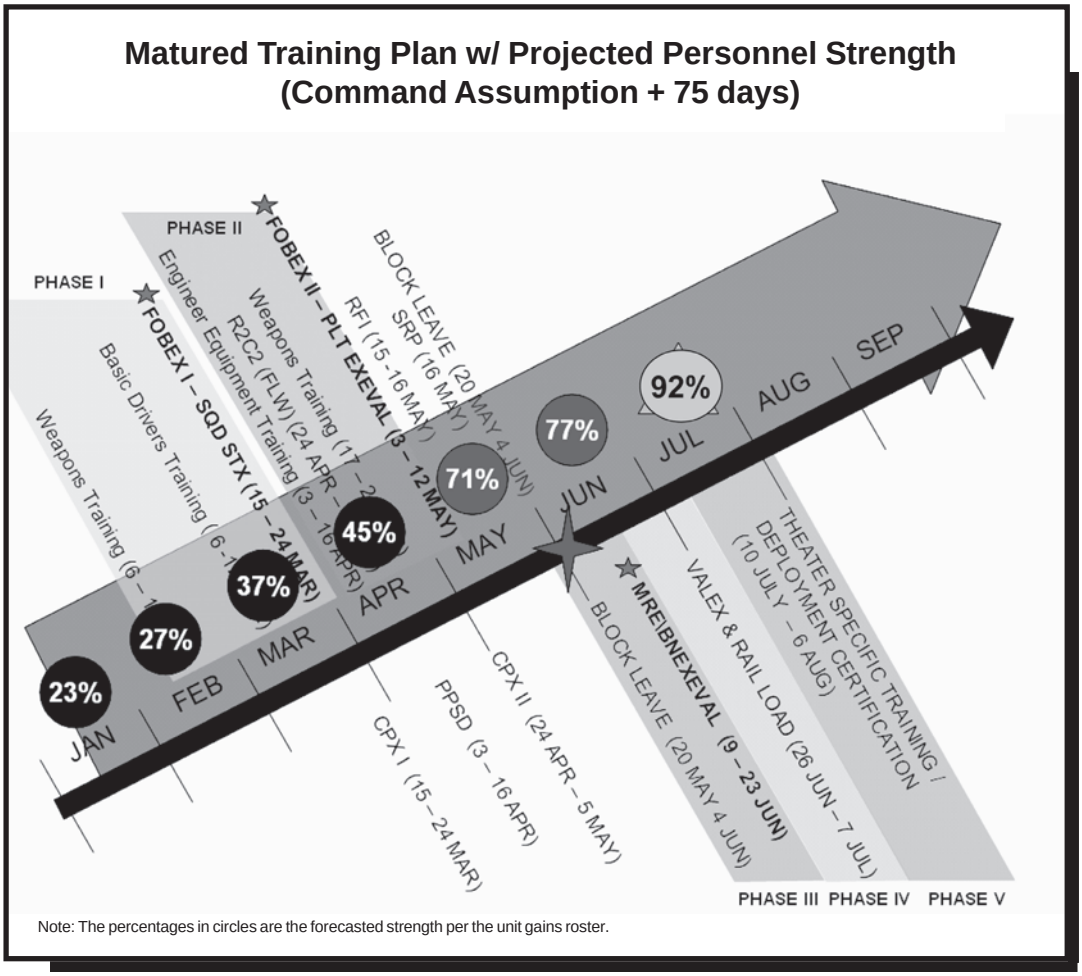


Figure 2

unable to due to their schedule and the number of instructors available. This results in a heavy reliance on piggybacking MTTs at other installations, tapping into the Reserve Component schools, and other creative solutions.

School costs consume a large portion of the budget. The school requirements list should be developed early, for both Military Training Specific Allotment (MTSA) and non-MTSA funding, to prioritize and to provide the Resource Management Office an awareness of the scope of the funding requirement.

The commander must decide where to take risk in the training plan based on the perceived downrange mission, projected troops and time available, and estimated equipment available. Depending on the location, this finely tuned plan can be easily aggravated by training resources that may have been locked in by program of instruction (POI) requirements prior to the unit even activating.

Ammunition

Be aware of long lead times, and request your Standards and Training Commission (STRAC) allocation as soon as possible. Even then, the unit will likely have to borrow ammunition for its early individual qualification ranges, so establish those points of contact at your installation.

Materiel

It is absolutely essential that all Class VII items be placed on order as soon as possible. This briefs well, but is hard to accomplish without the proper personnel and Standard Army Management Information System (STAMIS) equipment on hand to execute.

Prioritize MTOE into minimal essential sets. These initial sets should include a basic Soldier set and training equipment sets. The basic Soldier set should consist of the minimal equipment necessary to train basic warrior skills and should be the first to arrive, along with initial troops and leaders. The training equipment sets are the minimal equipment required to conduct essential MOS-specific individual tasks and selected collective tasks. These training equipment sets need to arrive, fully mission capable, in time to support the commander's training timeline.

In a perfect world, equipment transfer directives would be issued as soon as the MTOE was approved and would be waiting in holding yards for the unit to pick up on its effective date (E-date). Reality is a different story. This equipment transfer process is even more of a challenge when the unit has no corps headquarters to assist in the process. A corps will

ensure that all its shortages are filled within, prior to transferring excess equipment to a direct-reporting FORSCOM unit.

FORSCOM must exhaust internal excess—through equipment transfer directives—prior to the DA Assistant Chief of Staff, Finance (G-8), contacting the item managers to request a release of equipment. This process needs to be a synchronized effort between the FORSCOM Assistant Chief of Staff, Logistics (G-4); the DA G-8; the United States Army Materiel Command; and item managers.

Personnel

Installation Assistant Chief of Staff, Personnel (G-1)/ Adjutant General, must submit a request to add the battalion to the command section list early to get a commander on board. Early fill of leadership and key positions is essential (commander, command sergeants major, executive officer, S-3s, company commanders, first sergeants, personnel specialists, property book officers, supply sergeants). Get the leadership core on the ground prior to the influx of initial-entry training (IET) Soldiers.

Ensure that the installation strength manager works closely with the United States Army Human Resources Command (HRC), Distribution Division Branch, to validate personnel requirements and generate valid, open, unfilled (VOU) requirements for all open MTOE positions. Use the Enlisted Distribution and Assignment System (EDAS) and Total Officer Personnel Management Information System (TOPMIS) II to validate requisitions focusing on nonengineer MOSs, because these will slip through the cracks.

Facilities

Short-term activation requires the redrawing of unit footprints to integrate new organizations, but installations are accustomed to the long-term timeline of military construction. Work with the installation to develop an interim move plan that has the flexibility to meet the maturing requirements of the unit.

Funding

There is no such thing as modularity funding for echelon-above-brigade (EAB) units. Everything is a UFR.

Identify UFRs early, and submit them to FORSCOM to validate the requirements. In addition to the normal operation and maintenance cost, the unit must be funded for initial purchase of all stock-funded MTOE items, organizational clothing and individual equipment (OCIE), automated data processing equipment, and establishment of basic loads of all classes of supply.

The model used to project operation and maintenance requirements doesn't take into account all the activation costs associated with standing up a new unit. The establishment of unit basic loads and temporary duty cost associated with the school's requirement alone can burn much of the operational budget. The mass inflow of equipment transfer that is not quite at 10/20 standards can easily exhaust the remaining funds.

The unit will likely activate at the beginning of the fiscal year for various reasons, such as the chance of the federal government operating under a Continued Resolution Authority at the beginning of the fiscal year. This is fine for units that had a budget the previous year, but compounds the problems of a newly formed unit.

Additional Issues

While you may not have any control over it, begin the process early. Strive for as much time as possible between the establishment of the carrier unit identification code (UIC) and the E-date of the unit. To have only 13 days between the E-date of the carrier unit and the activation of the unit is *not* optimum.

Location, location, location. While in theory all Army installations now are Installation Management Agency installations (meaning there are no TRADOC or FORSCOM installations), the truth is that some installations are better suited for the multitude of tasks associated with activating a battalion. The facts are that an installation staff without an associated corps or division headquarters is rather thin. Distinct advantages can be observed between activating a unit at a location with corps staff present and a location that has not had a FORSCOM unit larger than a company on it since the mid-90s.

While an activating BCT will have an assigned Modular Force Coordination Cell, a Materiel Management Center, and the direct oversight of Headquarters, Department of the Army (HQDA), an EAB unit will seem like it is on its own. The Engineer School's Fusion Cell is the keystone to bringing together all the key players needed to assist the unit going through activation or Future Engineer Force conversion. The Fusion Cell is a direct conduit and voice amplifier for an EAB unit to communicate its questions, concerns, and issues to FORSCOM, HRC, and HQDA.

Conclusion

We acknowledge that our airplane is far from complete, and a lot of work lies ahead before we can land the plane in theater. However, as things continue to change in today's dynamic environment, hopefully others who also find themselves "building an airplane in the air" can benefit from our first experiences.

Lieutenant Colonel Paul is the commander of the 19th Engineer Battalion. His previous assignments include commander of the 3-410 Engineer Training Support Battalion and executive officer for the 1st Infantry Division Engineer Brigade during Operation Iraqi Freedom II.

Major Denney is the executive officer of the 19th Engineer Battalion. His previous assignments include brigade engineer for the Unit of Action Maneuver Battle Lab and observer-controller at the Combat Maneuver Training Center.

Combat Support Brigade (Maneuver Enhancement)

By Mr. Klaude A. "Tony" Miller and Mr. David L. Draker

The Army Transformation Plan (ATP) Roadmap of 2003 laid the blueprint for a radically different Army structure to be in place by 2014. The ATP marks the beginning of the end for the fixed-organization structure within the division and corps. In its place, a modular structure will be the hallmark of the future Army.

Transformation Plan

The Army will consist of new corps and division headquarters designed for joint force operations and for command and control of a tailored mix of forces capable of supporting full-spectrum operations. The traditional combat brigades will be restructured into modular forces called Brigade Combat Teams (BCTs) with improved force mixes, sustainability, and command and control supporting full-spectrum operations. While there will be different types of BCTs (Heavy, Stryker, and Infantry), they will be based on standard configurations, eventually evolving into the Future Combat Systems Brigade.

Along with the restructured BCT, some of the supporting structures of the traditional corps and division will be remodeled. There will be five new brigade-sized units designed to support the deployment and sustainment of the new BCTs. The first four new brigades are the Aviation Brigade, the Fires Brigade, the Battlefield Surveillance Brigade, and the Sustainment Brigade. All of these brigades are now under development as their concepts and organizational structures are shaped to support the modularity designs of the future Army. The last brigade element, the Combat Support Brigade (CSB) (Maneuver Enhancement [ME]), is the subject of this article.

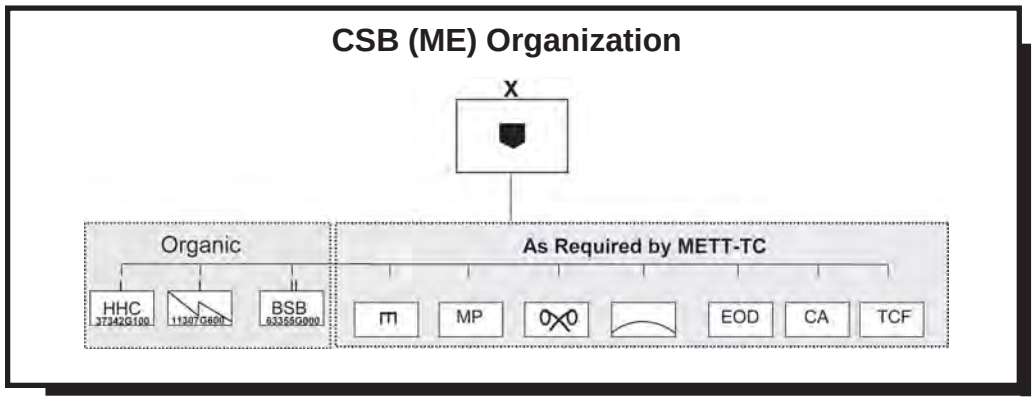
CSB (ME) Development

While each of the other support brigades can draw its lineage from previous organizations, the CSB (ME) has no direct precedent. It is a new headquarters structured to provide a single command-and-control element for multiple functions. Formerly, these multiple functions required individual command-and-control elements and force structures. The CSB (ME) combines disparate functional units such as engineer, military police (MP), chemical, signal, rear-area operations, and (when assigned) a tactical combat force (TCF) into the new organization structure.

Requirements

The new modularity concepts of the Army require a force structure that is responsive, flexible, manpower-efficient, and multifunctional. Additionally, the force requires capabilities in both joint- and single-component deployments and operations. Further, the force needs to accommodate new ideas in force packaging and deployment processes and be able to deploy as a self-contained unit in a nonlinear, noncontiguous operational environment. The CSB (ME) has been designed with all of these principles in mind.

The CSB (ME) was previously designated as the Maneuver Enhancement Brigade. The recent Army-level name change



has not lessened the basic tenet of the unit's mission: *Provide critical maneuver support to the supported force commander, normally at division level*.

In addition to maneuver support, the CSB (ME) addresses the need to provide multiple-proponent functions throughout the theater of operations without creating the large overhead associated with a division or corps rear command post. The new brigade has two major missions:

- *Maneuver support*—the integrated application of assured mobility and protection capabilities.
- *Terrain management*—within an assigned area of operations.

The CSB (ME) provides maneuver support through the provision of several major tasks: assured mobility, protection, terrain management, infrastructure development, and rear-area operations. These tasks are performed throughout an area of operations to ensure freedom of maneuver and preserve combat power. Previously, the division headquarters performed the functions of terrain management, infrastructure development, and rear-area operations—all of which have now devolved to the CSB (ME) within its area of operations.

- *Assured mobility* encompasses actions designed to guarantee the force commander the ability to move and maneuver where and when he desires, without interruption or delay, to achieve his intent.
- *Protection* covers actions intended to protect the integrity of the individual, the organization, and the force—both individually and collectively.
- *Terrain management* operations are actions that preserve the ability to operate and occupy the areas between the BCTs and the corps.
- *Infrastructure development* is restoration activities that support the return of stability and security in an occupied area and prepare the way for nation building and the return of internal national control.
- *Rear-area operations* enable the use of terrain and urban areas by forces not directly engaged in combat operations and allow the continuous provision of supplies and services to the committed forces.

Design Features

The CSB (ME) has several features to enable the support of full-spectrum operations. The design of the headquarters incorporates the ideas of modularity and multifunctional control. It will be robust and capable of operations in a noncontiguous, nonlinear environment. The only permanent structure of the CSB (ME) is the headquarters element with communications and logistics support.

The CSB (ME) force structure will be a tailored force based on the requirements of mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC). Generally, the brigade will consist of three to eight battalions of engineer, chemical, and military police units and will be specifically tailored with the addition of unique-capability units, such as explosive ordnance disposal (EOD) and civil affairs (CA), as needed.

The brigade headquarters has the necessary staffing to provide command and control for these combined functions. Each function is represented within the brigade staff through a planning and operations cell providing functional recommendations and decision-making information to the S-3 and the command group. Additional capability for multifunctional command and control is provided through a robust liaison cell.

While designed to control multifunctional forces, the brigade can also coordinate with a functional brigade to provide support to the division or corps. Based on the mission, the CSB (ME) may even detach a functional battalion to the functional brigade.

Initially, divisional BCTs will receive task-organized forces from the Army force pool based on METT-TC. When required by the division, the CSB (ME) may provide task forces to support BCT requirements for assured mobility and functional capabilities that go beyond the BCT's organic capabilities. The brigade can organize a task force, provide support and reachback capability, and then on return, refit the task force when the mission is completed.

Because of the nonlinear and noncontiguous nature of the future battlefield, the CSB (ME) was designed to operate in multiple areas. The brigade headquarters can deploy both a main and a tactical command post (CP) with the ability to compose and deploy an additional CP to support short-term or limited-objective missions such as sensitive-site exploitations. The CSB (ME) will have a dedicated organic brigade support battalion (BSB) to provide supply and transportation functions to the deployed units of the brigade.

A last major design feature is the addition of a section within the S-3 to provide the terrain management and rear-area functions. In the division area of operations, the CSB (ME) will perform missions such as coordination of stationing, base defense, protection of lines of communication, and area and local security.

The individual unit and base cluster retain defense responsibilities of the unit or base. However, when the threat level exceeds the capability of the organization, the CSB (ME) will provide for additional defensive support through the use of the assigned military police or tactical combat force. This assigned force will provide a needed tactical capability short of assigning a BCT with the protection mission.

Transition

While the exact stationing of the new CSB (ME) headquarters organizations has not been decided, the number of units will extend across the entire Army force structure. A limited number of organizations will be placed in the Active

(Continued on page 24)

One Team – One Fight

By Captain Lee Edmonds, Captain Brian Stone, First Lieutenant Carlos Restrepo, and First Lieutenant Charles Heaton

Task Force 91st Engineer Battalion, 2d Brigade Combat Team, 1st Cavalry Division, was assigned an area of operations in northwestern Baghdad from February 2004 to February 2005. Stability operations within the area established an around-the-clock operations tempo for the task force. Alpha Company, Task Force 91st Engineer Battalion, maintained operational control of 3d Platoon, Charlie Company, 458th Engineer Battalion (Wheeled), United States Army Reserve (USAR), which became known as 4th Platoon, Alpha Company, Task Force 91st Engineer Battalion. As with other Reserve units, the Soldiers held a variety of civilian jobs—students, teachers, local and state police officers, mechanics, and accountants. The true asset of this platoon was its manpower and combat engineer training.

Integration of 4th Platoon

During the mobilization time in Kuwait, 4th Platoon had no idea what its mission would be, so the Soldiers focused on individual combat engineering tasks and platoon collective tasks. Realizing that the ability to effectively execute its squad and platoon tasks would require them to have a foundation or basis of knowledge, the platoon set about achieving this knowledge. It did not focus on engineer annexes or engineer-specific tasks but rather on understanding basic troop-leading procedures, especially the operation order (OPORD). The platoon members trained on the simple five-paragraph OPORD, which became the known standard within the platoon.

As the leadership received warning orders (WARNOs) and OPORDs, the Soldiers knew that a mission was about to be executed and their preparation was key to the success of that mission. The ability to parallel plan and prepare proved to be critical for all units. The leadership consistently mentioned and relied on basic troop-leading procedures when it came to not only combat missions but also base camp tasks.

Alpha Company's mission was to conduct stability operations in the area of operations, which was composed primarily of Iraqi Sunnis. The 4th Platoon received training on cultural awareness, as well as convoy procedures, close-quarters combat techniques, first aid, and specific tasks associated with its mission.

The company master driver immediately began driver's training and licensing of the platoon members on the company's primary combat vehicles. The training was intensive, and on completion, the 4th Platoon became the wheeled platoon for Alpha Company.

The platoon zeroed and qualified its weapons, conducted numerous close-quarters combat ranges, and refined its standing operating procedures for urban operations. In 2 weeks time, 4th Platoon was virtually identical to the other three platoons in the company, with regard to training competency.

The driver's training, arming, and equipping of 4th Platoon was the least difficult part of integrating the platoon into the company. The challenge facing the platoon was to quickly understand the tactics, techniques, and procedures the company established within sector.

To facilitate the integration of 4th Platoon to the company's stability mission, a squad from 2d Platoon was task-organized under the command and control of 4th Platoon and a squad from 4th Platoon was task-organized under 2d Platoon. The squad from 4th Platoon observed and noted the tactics, techniques, and procedures of 2d Platoon and brought this knowledge and strength back to 4th Platoon.

4th Platoon Joins the Fight

The stability missions in the company sector were movement to contact, cordon and search, route security, and route clearance. The first mission given to 4th Platoon was a cordon and search for possible weapons and the questioning of a particular individual.

The platoon developed an initial plan of conducting an area reconnaissance in the neighborhood of the target as part of its patrol cycle. Each squad was given certain information requirements to observe and attain during its reconnaissance. As the platoon collected and analyzed the intelligence, it finalized the plan and issued an OPORD. The rehearsals were focused on a quick and thorough search inside the target and the actions of the squads and vehicles outside of the target. The platoon sergeant was to supervise the outside squads and vehicles, while the platoon leader supervised the search of the target. The level of detail disseminated throughout the

(Continued on page 40)

Photo by Sherlynn Borkgren

DEVELOPING AND MAINTAINING THE WARRIOR ETHOS IN ENGINEER UNITS

By Colonel Christopher W. Martin

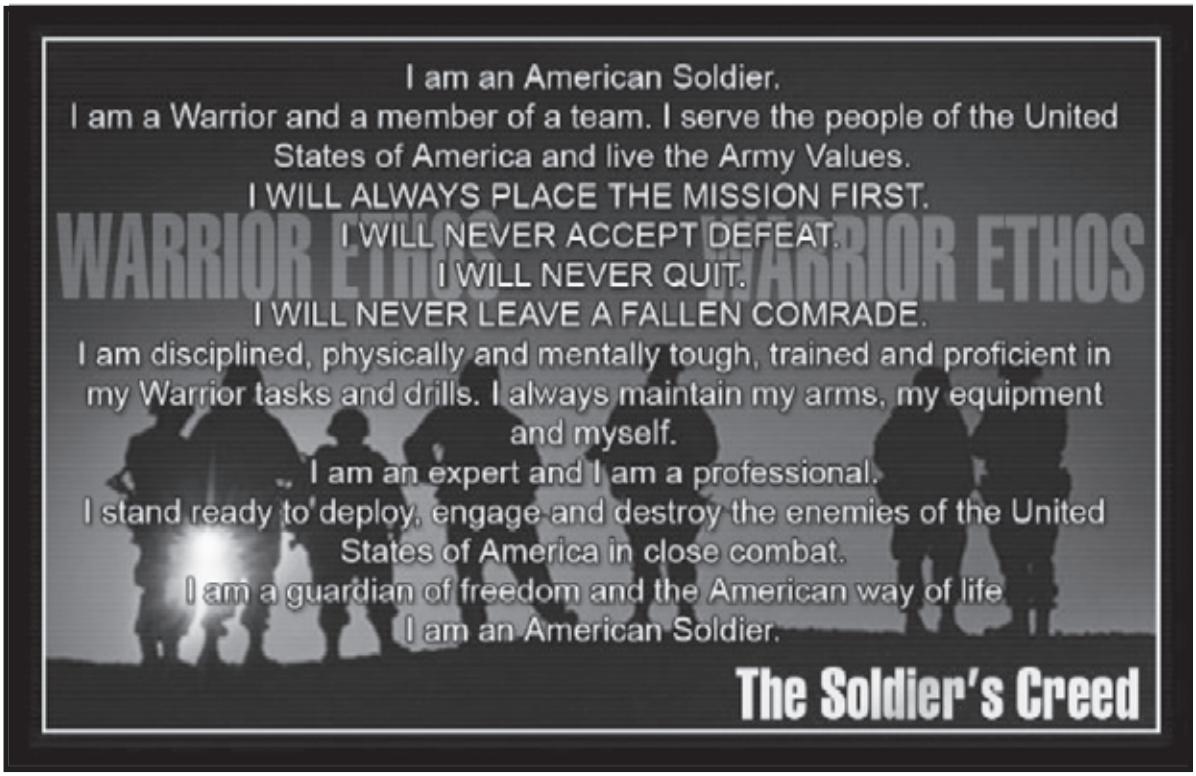
This article is aimed at helping company commanders and platoon leaders develop the Warrior Ethos in their units. It is based on things that worked for the 91st Engineer Battalion and ultimately led to the successful completion of a 14-month deployment in support of Operation Iraqi Freedom. Because of the way the battalion trained and the level of training reached, the brigade combat team commander had the confidence to let the unit fight as a task force in Baghdad. None of this happened overnight though; development of the Warrior Ethos began early and continued throughout the deployment.

As an Army, we talk about the "Warrior Ethos" or "Warrior Spirit" and how important it is for Soldiers and units to have this mindset to make them successful in combat. The Warrior Spirit takes on particular importance as units prepare to deploy and focus their training on the missions they anticipate once deployed. Units that don't make the development of a Warrior Spirit their priority are less likely to be successful in combat. Development of this ethos comes from discipline and training and is a continuous process, even when deployed. Units that develop and sustain a warrior mentality will find that their Soldiers are much more prepared mentally, physically, and emotionally to handle the rigors of continuous combat.

Training Warriors

It is our job as leaders to train and lead warriors. We must ensure that our units are ready to deploy at any time or anywhere and accomplish any mission. Even when a mission is not from a trained skill set, the mission must still be accomplished. Good units are able to accomplish any mission because they are disciplined, physically ready, and able to execute basic fundamental skills (blocking and tackling drills). They have leaders who have developed trust and confidence through hard, aggressive training.

Training is continuous, but ultimately begins and ends with noncommissioned officers (NCOs). In combat, NCOs must have the confidence to make decisions quickly; the ability and confidence is instilled during training. The commander's function is to guide NCOs and leaders in the unit to conduct the right training, under the right conditions, and according to standards. The commander (battalion, company, and platoon) is responsible for ensuring that NCOs know the standard and train to meet that standard. The commander arms his NCOs with the most valuable resource—adequate time to train. This is done by focusing on the tasks the unit will train on and determining what tasks will not be trained.



Tasks

Commanders determine the skills and tasks Soldiers will train on—refinement of the mission-essential task list (METL) and battle tasks accomplish this. Engineers typically have more "perceived" tasks and responsibilities than can possibly be trained and must determine what tasks should be trained. For instance, the likelihood of constructing an abatis or destroying a bridge is low, and therefore the 91st did not train on those tasks. They got more out of their training by focusing their squads and platoons on the most likely demolition missions they would receive: breach a lane through a minefield using hand-emplaced explosives, breach a lane through a wire obstacle, and breach a door or wall in a building. All demolitions training focused on performance of these tasks. Once deployment orders were received for Operation Iraqi Freedom, the unit's METL was changed to include the tasks most likely to be executed in Iraq; those that were not anticipated were deleted.

Live-Fire Exercises

Probably the most important training conducted involved live-fire exercises (LFXs). Several LFXs were conducted at the squad and platoon levels, independent of the maneuver task forces, to give the Soldiers confidence in their weapon-handling abilities and their leaders confidence in coordinating and directing fires. LFXs also provide a valuable opportunity to train communication skills at the leader level. The 91st required the company commander to be present at the range and running the exercise for a squad-level LFX, and a field grade officer was required for all platoon-level LFXs. This allowed platoon leaders to communicate with squad leaders at squad-level LFXs and company commanders to work with platoon leaders at platoon-level LFXs.

LFX scenarios were based on combat, initially for the invasion into Iraq and later for the actual mission. Because the unit built the scenarios themselves, they had to understand Army Regulation 385-63, *Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat*. The principles outlined in this regulation carry over into combat and ensure that officers and NCOs have a good understanding of surface danger zones (SDZs) and weapons orientation.

The ability to clear a room and building is a task every combat engineer unit should have. It is a task that the 91st performed almost daily and often multiple times in a day. It is also a task that must be retrained constantly. Field Manual 3-06.11, *Combined Arms Operations in Urban Terrain*, explains how to do it properly, and commanders should coordinate with infantry units to help train leaders on this important battle drill. Every patrol and every Soldier that rolls off the forward operating base in Iraq, regardless of their military occupational specialty, stands the chance of making contact with the enemy and must be prepared to defeat the enemy through aggressive actions. Quite often, this will include clearing a building to kill or capture the enemy initiating the attack.

Weapons Training

The importance of weapons marksmanship and reflexive-fire training cannot be overemphasized. The confidence

Soldiers develop in their weapon systems from constant shooting will be manifested when they are in a firefight. Likewise, training on crew-served weapons and squad automatic weapons (SAWs) is vital, and proficiency on these weapons must be attained. There are other extremely useful means to train; for example, the Engagement Skills Trainer, which allows leaders to exercise rules of engagement (ROE) training is a great resource, if available.

Commanders should look for other unique capabilities their unit may require and find ways to train Soldiers on those tasks. A capability that builds confidence in units and in individual Soldiers is advanced marksmanship courses and sniper training. Snipers and excellent marksmen are invaluable in the urban environment and play an important role in many missions. The 91st trained snipers in each company down to platoon level. They were able to field an M14 sniper rifle in each line company, but had already purchased scopes for M16A2 rifles to develop platoon snipers. Even if it is not possible to field sniper rifles, the best shooters should be identified and sent to advanced marksmanship courses.

Combat Lifesaver Course

Another morale builder is the combat lifesaver (CLS) course. The battalion's standard for combat lifesavers is that every Soldier must be CLS-trained. The 91st held CLS courses weekly, even in Iraq, and Soldiers were recertified while deployed. Soldiers knew that if they were wounded while on a mission, their friends could take care of them. In Iraq, CLS-trained Soldiers were vital to saving lives because they provided initial aid until the wounded Soldiers were medically evacuated to Level II care.

Equipment

Part of developing the Warrior Spirit is making Soldiers feel like warriors. One way to achieve this is to get the special equipment they need to conduct the mission. The Rapid Fielding Initiative goes a long way toward fulfilling that goal, but other pieces of equipment were recommended by Soldiers, such as door breaching kits, sniper scopes, spotlights and spotting scopes (for identification of improvised explosive devices [IEDs]), and collapsible ladders. Training on this equipment at Fort Hood, Texas, instilled confidence at the Soldier level prior to deployment. No matter how much equipment a unit buys, if Soldiers aren't trained on it, it doesn't matter. Mount M68s on weapons and train Soldiers to shoot with them. Learn how to use AN/PAS-13 Thermal Weapon Sights (TWS) before deployment. Enforce mounting all optics on weapons for every training event. The advantage over the enemy in Iraq using these weapon systems—fully-mounted with all optics—cannot be overstated.

Civilian Training

Get Soldiers the training they need to be successful, even if it is not available in the military. The 91st contracted with a civilian specialty school to ensure that their NCOs learned the correct standards and techniques for explosive breaching of a building. School personnel came to Fort Hood for a training session and trained 91st Soldiers using condemned apartments in a nearby community, and later the 91st sent several NCOs to attend the course at a civilian site. The morale of the NCOs who attended the course rose, and the battalion became expert at explosive breaching.

Training During Deployment

Good units continue to train even after they are deployed. Training should be focused on tactics, techniques, and procedures (TTP); lessons learned; and the fundamental skills needed for the unit to continue to be successful. Commanders should use this training to refine the lessons learned, develop methods to counteract the enemy's actions, and retrain areas identified as weaknesses in the unit. Again, continuous training improves Soldier morale and confidence.

Leaders should read and discuss after-action reviews and lessons-learned documents for the war in Iraq and Afghanistan and incorporate that information into training. It makes the training more relevant and gives Soldiers a sense of why they are doing the training. This is a baseline only, and things change.

Attitude

Not every aspect of developing the Warrior Spirit involves training. There is a psychological element also. If commanders constantly tell their Soldiers how good they are and how good their unit is, soon they will live up to that billing—if they are not already. Soldiers will have pride in their unit, and NCOs will develop a mindset that they can overcome any problem they face. Confidence developed in their capabilities will be manifested in their everyday attitude and actions. Soldiers cannot be trained for every contingency, but commanders can develop a Warrior Spirit in Soldiers that allows them to adapt to the situation and prevail.

Conclusion

As a commander, you should evaluate your unit and see where you are in establishing the Warrior Spirit in your Soldiers. If it is not at the level you want, begin to instill it now. Be creative in your approach to training, and emphasize to your Soldiers why they are training a particular way. Try to build flexibility and an attitude that the unit can do anything, and you will not be disappointed.

Colonel Martin is currently a student at the United States Army War College. His previous assignments include Commander of the 91st Engineer Battalion for 36 months, as well as assignments in the United States Army Training and Doctrine Command (TRADOC), Southern European Task Force (SETAF), 1st Infantry Division, and the 101st Airborne Division.

JOINT ENGINEER OFFICER COURSE

By Mr. Robert B. McFarland, Jr.

"We continue to improve joint professional military education to provide more joint experiences, education and training to warfighters—junior and senior officers and noncommissioned officers. At the senior officer level, a modified capstone course will increase the emphasis on jointness while preparing senior officers to lead joint task forces and other joint operations. For junior officers and noncommissioned officers, incorporating joint education and training early in their careers ensures future leaders will more effectively integrate tactical operations with interagency and multinational components." (The National Military Strategy of the United States of America 2004. A Strategy for Today; A Vision for Tomorrow)

"Early planning efforts within the C-7 (engineer section) were hampered by a lack of knowledge of capabilities, requirements, and limitations of other service and coalition engineer forces, particularly among junior members of the staff. Action officers are often junior field grade or company grade officers who do not have sufficient joint engineer education or experience to be effective at the beginning of their assignment." (An after-action review comment from Operation Iraqi Freedom, Engineer, *January-March 2004,* "Joint Engineer Training, Joint Officer Education of the Future," *pp: 19.)*

Engineer Capabilities Study

The final report of *The Engineer Capabilities Study: A Path to the Future*, 30 September 2002, identified that joint task force (JTF) engineer staffs are comprised of *several* 0-4 through 0-6 officers who may or may not have been exposed to joint professional military education (PME) and *many* 0-3s who have not. It further identified that most joint PME has little or no engineer content. Consequently, most officers assigned to JTF engineer staffs have little or no understanding of engineer capabilities outside of their own service and experience a steep learning curve before they are able to function effectively in a joint engineer environment. The report recommended that a 3- to 4-hour joint engineer orientation be presented at service engineer advanced courses (for senior 0-3s), followed by a Web-based, self-paced instruction program.

Proposal

The Joint Operational Engineering Board (JOEB) is the premier advisory group and proponent for operational engineering issues. Its charter is to oversee efforts to enhance joint engineer processes and capabilities to meet combatant commander's requirements. In an effort to address the JTF staff officer education issue, the board proposed a more formal joint officer education for the targeted engineer population. Joint education for officers already exists in limited amounts at engineer officer service schools, but there is no room for additional schooling without deleting other required subjects. The board's recommended solution was to establish a stand-alone course that would be more rigorous in its joint education and would better focus and prepare officers for assignment to a joint engineer staff. The proposed course is titled the *Joint Engineer Officer Course (JEOC)*.

Course Development

The JOEB assigned the JEOC development task to its Doctrine and Training Working Group. After extensive coordination and months of hard work, the working group and other key engineer personnel from all the services met at Fort Leonard Wood, Missouri, for a Training Developers Conference in the fall of 2005. At the conference, the combined efforts of the engineers resulted in a refined concept and course outline for the first JEOC pilot course that will be executed as a two-phase course in the spring and summer of 2006 at Fort Leonard Wood.

Distance Learning Phase

The 48-hour distance learning (DL) phase, which begins in March 2006, consists of eight modules with associated lessons that introduce students to—

- National security strategy development.
- Joint operations planning.
- Joint engineer capabilities.
- JTF engineer operations and planning.
- Engineer staff organizations and staff responsibilities within a combatant command.

Resident Phase

The 32-hour resident phase, scheduled for 19 – 23 June 2006, consists of eight seminars aligned with six practical exercises (PEs) (27 hours). The PEs are built around JTF scenarios that require students to develop and demonstrate an understanding of different service engineer capabilities and the common functions and responsibilities of a JTF engineer staff officer at the senior 0-3 and junior 0-4 grades. In addition, other PEs include—

- Task organizing engineer forces.
- Understanding the development and expectations of the engineer support plan.
- Understanding the Joint Engineer Planning and Execution System (JEPES).
- Understanding the JTF boards that an engineer staff officer is a member of.
- Understanding the functions and processes involved in financing, contracting, base camp development, and coordination with host nation and nongovernment organizations.

Upon completion of the JEOC, the student will be able to—

- Describe joint operations, joint warfare, and the joint planning system.
- Describe, comprehend, and apply joint engineer doctrine.
- Describe, comprehend, and apply joint engineer planning (to include the JEPES) by using scenarios, historical examples, case studies, and PEs.
- Describe and comprehend service engineer capabilities and support requirements, to include operating as part of a coalition.
- Describe, comprehend, and apply the strengths, effects, and basic doctrinal employment concepts of service engineers.
- Describe, comprehend, and apply employment principles for using service engineer capabilities in support of joint- and service-engineer requirements.

Goal

The JEOC is designed as a joint operations introductory course for junior leaders at the senior 0-3 and junior 0-4 levels, as well as for specified noncommissioned officers at the rank of senior E-7 through E-9 and others associated with joint engineer operations. The goal of the JEOC is to provide selected engineer officers with a basic understanding of the capabilities and organization of engineer forces of the U.S. military to better prepare them for duty on a staff in support of the JTF engineer and joint force commander. The course will provide enough grounding for students to understand the responsibilities of a staff officer assigned to the joint engineer staff section of a JTF. The major focus of the course is to introduce students to joint doctrine, planning and operations (specifically engineer operations), and the type of engineer staff positions and associated products engineers are required to develop.

Summary

The JEOC is a course designed by engineers for engineers.The pilot course will bring together engineers from all the services, who will test the lessons and materials for applicability in the current operational environment, as well as for future application to meet the challenges faced by engineer forces of the U.S. military in the 21st century. All engineers are strongly encouraged to monitor the progress of the JEOC as it develops and provide insight based on their personal experiences while working as a joint engineer staff officer.

Questions or comments pertaining to the JOEC can be addressed to the Training Integration Office, United States Army Engineer School. The point of contact is <*robert.mcfarland@wood.army.mil*>, (573)-563-5402.

Mr. McFarland is a contractor working for C2 Technologies, Incorporated©, in the Training Integration Office of the United States Army Engineer School. He is the project manager for developing the Joint Engineer Officer Course concept, along with other ongoing joint efforts.

Dedication

The following members of the Engineer Regiment have been lost in the Global War on Terrorism since the last issue of *Engineer,* or were inadvertently omitted from a previous list. We dedicate this issue to them.

First Lieutenant Simon T. Cox, Jr.	1st Battalion, 66th Armor Regiment	Fort Hood, Texas
Specialist Dustin L. Kendall	1st Battalion, 68th Armor Regiment	Fort Carson, Colorado
Sergeant Monta S. Ruth	1st Battalion, 15th Infantry Regiment	Fort Benning, Georgia
Specialist Roberto L. Martinez Salazar	14th Engineer Battalion, 555th Maneuver Enhancement Brigade	Fort Lewis, Washington
Staff Sergeant Michael J. McMullen	243d Engineer Company	Baltimore, Maryland
Private First Class Thomas D. Caughman	391st Engineer Battalion	Spartanburg, South Carolina
Staff Sergeant Christopher R. Morningstar	562d Engineer Company, 172d Stryker Brigade Combat Team	Fort Wainwright, Alaska
Sergeant Jeremiah J. Boehmer	562d Engineer Company, 172d Stryker Brigade Combat Team	Fort Wainwright, Alaska

By Captain Khang Ho

The Combat Maneuver Training Center (CMTC) at Hohenfels, Germany, underwent a transformation last year in an effort to better support the Global War on Terrorism. Now known as the Joint Multinational Readiness Center (JMRC), it welcomes the task of integrating our European allies in training exercises with U.S. forces. In an effort to improve its abilities as an expeditionary training center, it deployed observer-controller (OC) teams to Bulgaria and Romania to train their forces in side-by-side exercises with U.S. forces, hosted Czech and Polish forces in exercises at JMRC and various outlying German installations to conduct training with U.S. forces, and continues to provide quality multinational training geared to winning the war on terrorism.

Winning on the battlefield is what we do. As a company OC at JMRC, I have observed many sapper units going through training for deployment downrange. Sappers are trained and equipped with unique skills that support mobility, countermobility, survivability, and sustainment engineering missions. They are prepared to execute combat operations with traditional engineer tasks in an urban environment. When called on to fight as infantry, however, engineers must still be a force a commander can expect to augment with fire support. In view of the many activities being executed on today's asymmetric battlefield, we need to ensure that engineers aren't losing sight of the basic infantry skills that they have been called on to use in the past.

The operating environment engineers face today is an enemy employing classic insurgent tactics: ambushing troops on the roads with improvised explosive devices (IEDs), intimidating Iraqi security forces, assassinating Iraqi government officials, and terrorizing the population with random car bombings. Fighting these insurgents is, by its nature, small-unit engagements. Most sapper squads will engage in at least one random close-quarters firefight with suicidal fanatics armed with grenades and automatic weapons.

Sappers have no problem performing the engineer battle drills; however, they must be proficient in basic infantry skills as well. Whether it is IEDs, indirect fire, or direct-fire contact, sappers must know the basic battle drills so they can quickly and decisively fight through these engagements regardless of mission type.

While engineers contribute extensively toward achieving national goals as civic-action units, during combat operations engineers can be used in a secondary role as infantry. When a threat arises, engineers can be used as infantry on operational bases when all tactical units are committed or as reserves when the threat has caused the commitment of all available reserves.

Engineers conduct operations in an urban environment at the JMRC in preparation for their upcoming deployment.

Engineers use the "stack" technique at a door before entering and clearing a building.

For the most part, engineers are going to be fighting as a motorized infantry company downrange. Engineer companies can be expected to conduct urban combat operations such as cordon and searches, raids, combat patrols, and establishing traffic control point missions. These missions are complex and require dedicated planning and focused mission rehearsals before execution. Maneuver companies are often given opportunities to plan, rehearse, and execute these missions at JMRC when conducting an Operation Iraqi Freedom or Operation Enduring Freedom scenario, and it should be no different for an engineer company.

The task force must free itself from traditional, unit-specific jurisdictions and understand that engineer units require the same training if they are to fight as infantry. Cordon and search operations require detailed planning and rehearsals, using available forces and assets properly. Engineer leaders must be ready to plan and conduct these missions and must be able to convey to the task force commander what capabilities engineers bring to the fight. Engineers need the same training as the maneuver unit on stack drills, entering and clearing a building, and proper search and detainee handling procedures. Infantry and armor task forces would rather use their maneuver companies to perform the more difficult tasks rather than train the sappers to their fullest capabilities.

JMRC is effectively training units on the tactics, techniques, and procedures (TTP) that are being employed downrange in regard to IEDs. A state-of-the-art IED lane was built to give units the scenarios of IEDs employed in Iraq and Afghanistan. Engineers control most of the equipment in the Army for combating IEDs. The Buffalo is a great asset when it is used to confirm or deny suspected IEDs. As we have seen, IEDs have been, and will continue to be, the most dangerous and effective killer of coalition forces.

Task force commanders have to start looking at their sappers as one of their lethal forces on the battlefield and train them as such by giving them missions that will challenge their skills not only as engineers but also as a fighting force capable of locating and destroying the enemy. The doctrine and TTP that are being trained and honed at JMRC do work in combating IEDs and insurgent tactics and must be used correctly on the battlefield.

Engineer leaders must remind maneuver commanders of the need to increase security so we can do our missions. Much of the engineers' time is spent interfacing with the populace during civil action projects or conducting route reconnaissance to defeat IEDs. Although engineers can provide security, the full capabilities of engineers cannot be used if they are conducting security. Maneuver commanders should assign this mission to infantry or military police.

As engineer leaders, we must be able to sell to maneuver commanders what our capabilities are and how engineers can help the task force in winning the fight. We can conduct demolition, route reconnaissance, and route clearance; develop protective positions; and build field fortifications. Engineers can also assist the task force with basic environment infrastructure—sewage, water, electricity, academics, and trash (SWEAT) assessments. And last, but not least, engineers can fight as infantry.

Captain Ho is an observer-controller at the Joint Multinational Readiness Center in Hohenfels, Germany. Previous assignments include commander of an engineer company in Korea. He is a graduate of the Engineer Captain's Career Course.

Brigade Route Tracking at JRTC

By Major Ted D. Yates

The safe, reliable, and secure operation of a surface transportation system within a brigade combat team's (BCT's) area of operations (AO) depends on collaboration and coordination across organizational boundaries. Units within or transiting across the BCT's AO need information to plan safe and predictable movement in terms of travel time while considering a host of variables that influence a route's condition.

Route tracking is a tool to help commanders and staffs plan movement times, route selection, adjustment of force protection measures, and prioritization of route reconnaissance and clearance efforts. The procedures for route tracking outlined in this article are not currently addressed in doctrine and portray a method of managing route information based on rotational unit practices at the Joint Readiness Training Center (JRTC) and unit products from Operation Iraqi Freedom.

Effective route tracking is a result of a nested process between units transiting the BCT's operational environment and the battalion and BCT staffs. The analytical capability of the staff at the BCT level can provide a regularly updated, single-source product to subordinate units and units traveling through the BCT's AO. Examples of unit and staff input are listed in Table 1. The "landowning" battalion task forces provide routine (time-driven) and event-driven reports to the BCT on the route status criteria concerning route capability, threat incidents, civil activities, and friendly activity within the battalion task force's AO to develop an accurate common operational picture of the brigade route status.

Route-tracking collection systems must provide timely, reliable, accurate, and relevant information, and they must be disseminated properly to be effective. Credibility is an extremely important consideration in properly implementing a route-tracking system. Regardless of how well a unit designs a tool, units will eventually distrust the system if it is not updated to reflect current conditions. Each time the information displayed is disproved, the credibility of the system decreases. Figure 1, page 22, shows a method of information flow of incidents and subsequent actions, and Table 2, page 22, shows a method of route-status distribution.

If possible, classify routes with the color-coded standard (Green, Amber, and Red) from checkpoint to checkpoint based on associated route status criteria. Additional reasons for route status (ongoing friendly operations, weather effects, construction, congestion, and threat incidents) can be displayed on the graphics with pertinent data such as rerouting criteria and related date-time groups.

Table 1. Unit and Staff Input Into Route Tracking

Element	Input
Units	Ongoing/future operations – patrols, cordon and searches, neighborhood engagement/ development, traffic control points (TCPs), route capability, threat incidents, congestion due to random events (threat incidents, accidents, or breakdowns), impacts of recurring congestion due to daily/weekly cycle of events (work/market/religious) or religious/national observances, frequency of congestion (time periods, volume of traffic, and speeds of traffic along routes).
Brigade S-2	Threat incidents, predictive analysis/event template, and intelligence preparation of the battlefield.
Brigade S-3	Authority for raising and lowering route status and associated force protection measures, rerouting authority, monitoring units transiting through the BCT's AO, monitoring BCT asset movements, route clearance efforts, explosive ordnance disposal (EOD) operations.
Brigade Engineer	Overall staff proponent for route status tracking (a way); weather and terrain impacts; route capabilities; and monitoring planned construction, work zones, and closures.
Brigade S-4	Monitoring ongoing/future combat logistic patrol movements and requirements, monitoring contracted movements and coordinates, and monitoring echelon-above-brigade logistic movements within the BCT's AO.
Brigade Civil Affairs	Population traffic patterns and congested areas – market areas/times, anticipated demonstrations/rallies, displaced civilian patterns, pilgrimages, holidays or observances, school congestion times, nongovernmental organization movements.

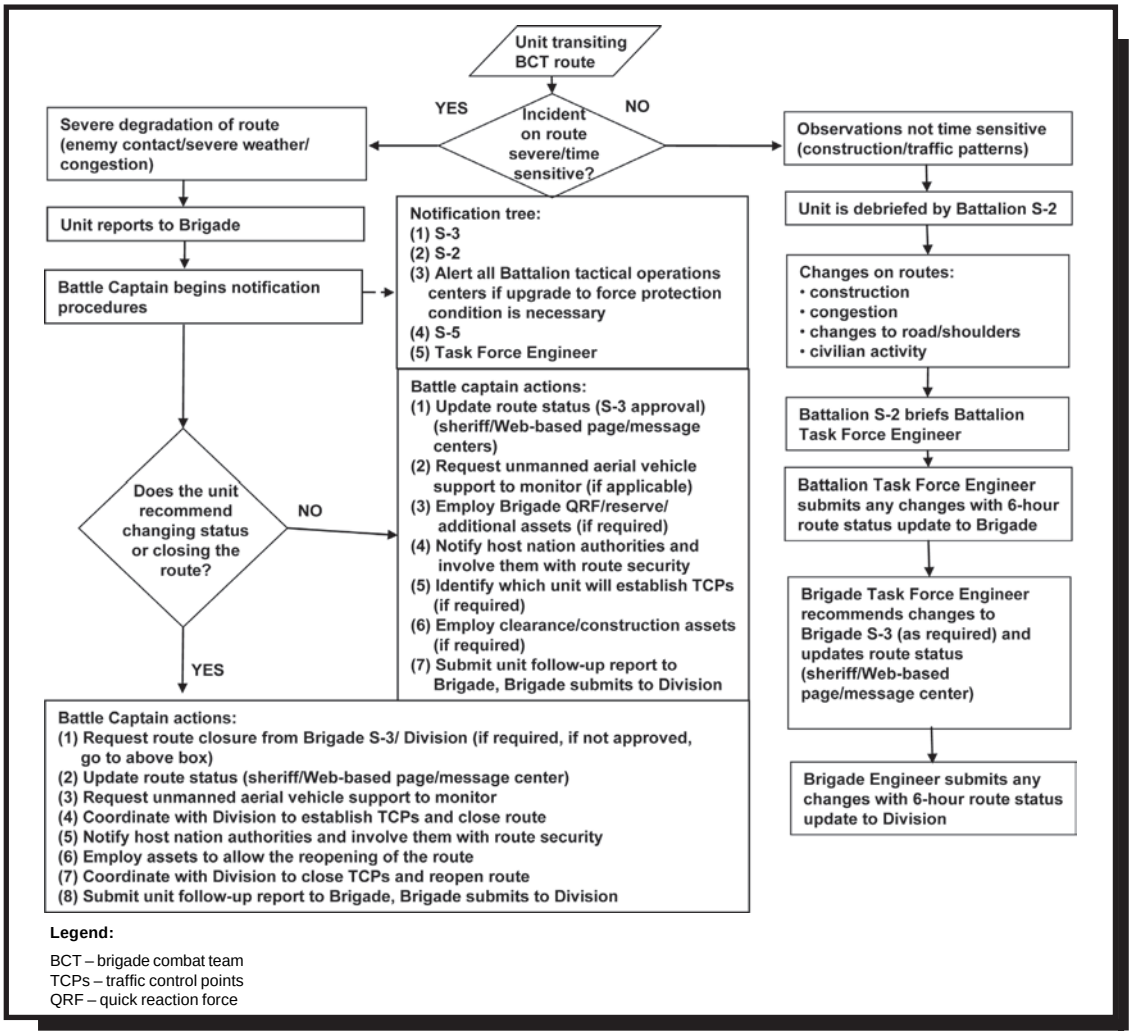


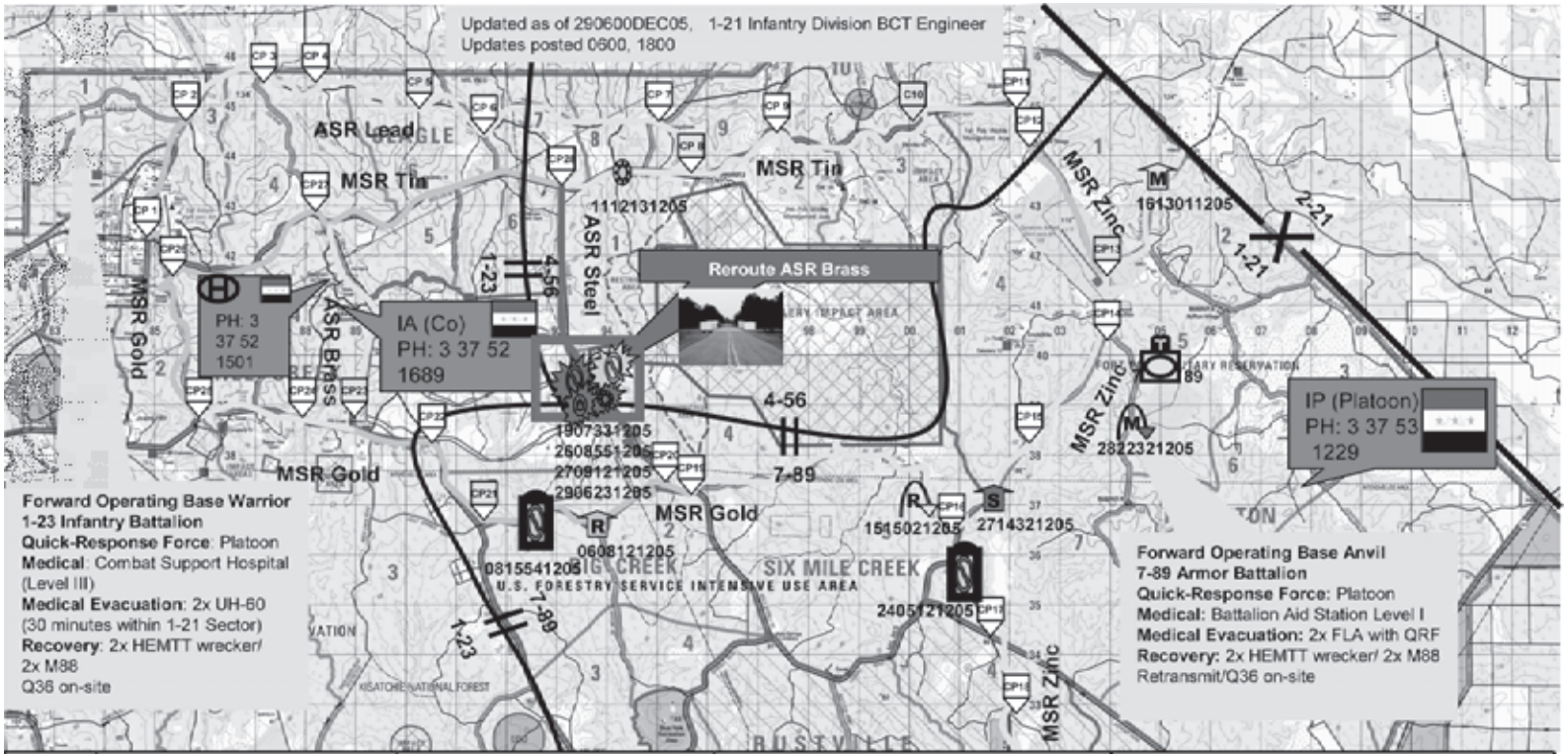
Figure 1. Sample Route-Tracking Information Flow Chart

Table 2. Methods of Route Status Distribution

Prior to Movement	During Movement
Blue Force Tracker/ Force XXI Battle Command Brigade and Below (FBCB2)	Blue Force Tracker/FBCB2
Convoy brief by staff	
Maneuver Control System-Light (MCS-L)	
Frequency modulation (FM) (sheriff network [NET])	FM (sheriff NET)
Telephone answering-machine message	Telephone answering-machine message
Message board at compound exit gate	
Web-based page	

In Figure 2, page 23, the route status criteria is limited to four areas (weather/congestion/trafficability, threat, obstacles, and protection measures) and addresses restrictions, constraints, and limitations of the routes and the units transiting them. It also prescribes how a unit can raise a route status through proactive measures; for example, conducting clearance operations or confirming a clear route.

This article reflects the practices of units training at JRTC and should not necessarily be construed as Army policy or doctrine. The intent is to provide commanders and staffs with



Standards	Weather/Congestion/Trafficability	Threat	Obstacles	Protection Measures
Green	No restrictions; all traffic capable above 60 kilometers per hour	IED unlikely; confirmed clear past 2 hours	Confirmed clear past 2 hours	3 vehicle minimum, 1 rifle per vehicle, 1 crew-served, 2x frequency modulation communications
Amber	Restricted capable up to 60 kilometers per hour; maintenance time < 24 hrs	IED activity probable; confirmed clear 2 < 6 hours	Mines/UXO marked and safe bypass exist	All from Green plus 4 vehicle minimum, 2x crew served, 1x Blue Force Tracker FBCB2
Red	Severely restricted capable up to 40 kilometers per hour; maintenance time > 24 hrs; NO HET, NO M870 trailer	IED activity imminent; clear last 6 < 12 hours	Mines/UXO identified and reported, not marked; safe bypass not identified	All from Amber plus no unarmored vehicle, minimum 2x dismounts per vehicle

Unit	Call Sign	CMD Freq	A/L	Sheriff / MEDEVAC / Retransmit
1-23 IN Bn	Raider	520	527	929 / 700 / 900
4-56 IN Bn	Coyote	620	627	929 / 700 / 900
7-89 AR BN	Rhino	720	727	929 / 700 / 900
TM Clear	Sapper	485	489	929 / 700 / 900

Yellow check points indicate Tactical Operations Center notification points for check in on cross boundary movement

IED Attack
IED Found
VBIED Attack
VBIED Found
Mine Strike
Mine Found
Indirect Rocket
Indirect Mortar

Legend
Small Arms
Rocket
Missile
Icon Colors
Current Week
Last Week
2 Weeks Ago
3 Weeks Ago

Area of Interest
Current Tier 1 Hot Spot (T1 Hour)

Legend:

AR – armor
ASR – alternate supply route
CP – check point
FBCB2 – Force XXI Battle Command Brigade and Below
FLA - field litter ambulance
HEMTT – heavy expanded-mobility tactical truck
HET – heavy equipment transporter
IA/IP - Iraqi army/Iraqi police
ID – infantry division
IED – improvised explosive device
IN – infantry
MEDEVAC – medical evacuation
MSR – main supply route
PH - phone
TM Clear - route clearance team
UXO – unexploded ordnance
VBIED – vehicle-borne improvised explosive device

Figure 2. Sample Route Tracker, Brigade Level

Figure 2 is an example of a single-source product which graphically portrays the BCT's AO route status common operational picture. The information allows the unit to—

- Determine main supply routes (MSRs) and alternate supply routes (ASRs), with check points, using the map with an overlay.
- Identify (ID) boundaries for landowners and check-in point for cross boundary movement.
- ID telephone numbers, command frequency, and administrative and logistics frequencies with command post call signs for landowners.
- ID recent threat incidents (within 30 days) with possible analysis—for example, indicators of increased threat and possible route alternatives (timing, dispersion, alternate routes). Often this will use callouts with images for better resolution.
- ID locations of compounds/forward operating bases (FOBs), police stations, host nation or coalition military compounds, and other significant friendly organizations with security capabilities.
- ID locations of coalition medical facilities/aid stations (generally on compounds/FOBs).
- ID aerial medical evacuation (MEDEVAC) capabilities (frequency, call sign, and general response time).
- ID friendly quick-reaction force (QRF) and maintenance recovery capabilities (generally, type of unit, base camp, and size).
- ID guard or sheriff frequency.
- ID if there is a route security element—for example, a military police unit or artillery unit—in addition to a landowner (should be identified with frequency and call sign).

a tool to examine an existing route-tracking system or initiate a new system. There are numerous methods, techniques, and criteria that can be employed to evaluate and disseminate route status. If you have "best practices" concerning route tracking or any other aspects of assured mobility that would prove valuable for units preparing for deployment, please contact the JRTC Brigade Command and Control Engineer Team at <*ted.yates@polk.army.mil*>.

Major Yates is a brigade engineer observer-controller at the Joint Readiness Training Center. Previous assignments include assistant engineer plans officer for Combined Joint Task Force (CJTF)-76 in Afghanistan. He holds a bachelor's in history from Georgia Southern University.

("Combat Support Brigade," continued from page 12)

Army, while the remainder will be spread throughout the Army National Guard and United States Army Reserves. The first four units will be activated in fiscal year 2006.

The formulation of this new unit will require two major adjustments in the philosophy of training. The first is in the development of the senior leadership through progressive education and experience. The ability to command and control a multifunctional unit demands the development of new skills to coordinate multiple functions into an integrated execution plan. The second is the development of the collective skills within the headquarters to produce a coordinated and integrated understanding of the multiple functions on the tactical and operational environment of the future.

The United States Army Maneuver Support Center (MANSCEN) is currently designing the training plans and materiel to support the formulation of the new headquarters.

Summary

The deployment of the newly created CSB (ME) will provide a valuable and capable element to the Future Force. The brigade will provide support to the committed BCTs; perform missions in its own area of operations to support the offense, the defense, or stability operations; and support the division and corps rear areas with essential control functions.

Mr. Miller is the director of Fort Leonard Wood operations for TecMasters, Inc. A retired lieutenant colonel, he holds a bachelor's in business administration and a master's in management from California Polytechnic University, Pomona.

Mr. Draker is a combat experimentation analyst with the MANSCEN Futures Center, Maneuver Support Integration Division, and is engaged in the development of concepts, organization, and doctrine for the CSB (ME). A retired lieutenant colonel, he holds a master's in logistics management and a master's in business administration from Florida Institute of Technology.

Troop-Leading Procedures Planning Process

By Captain Brian LaMarca

Upon returning to the base camp after patrolling in western Baghdad, the company commander is directed to report immediately to the task force tactical operations center (TOC), where he is briefed that he will be executing a company raid with an attached Special Forces team at an unknown address in less than 6 hours. By the time the commander departs the TOC, he has about 5 hours to plan, coordinate, and execute this mission based on very vague intelligence.

This situation happened to me in my third month of command and—for the first time—tested the planning process I used to develop effective and expedient troop-leading procedures. As a battalion planner and company commander, I saw three approaches used to tackle the planning process:

- *Centralized planning*—dictating information down to assigning individual vehicle positions and sectors of fire.
- *Cooperative planning*—gathering the platoon leaders together and deciding, as a unit, how the company would fight.
- *Framework planning*—issuing a clear intent and the task and purpose for each element and relying on platoon-level planning to round out the plan.

Centralized Planning

Advantages

With centralized planning, the commander lays out his intent with specific instructions—down to squad and vehicle level—for items such as movement order, positions on the objective, and sectors of fire. The clarity of this method leaves very little room for platoon leaders to question or determine how they will maneuver and makes maximum use of the commander's experience in employing his assets.

Disadvantages

One of the disadvantages of centralized planning is the amount of time required for the company to develop its very detailed operation order (OPORD) and graphics. Any delay in

A Soldier updates the commander after completing a mission.

Effective planning ensured the success of any type of mission, even this route security mission in western Baghdad.

the completion of the OPORD quickly devours the time available for the platoons to conduct their troop-leading procedures. This becomes a serious concern when operating on a compressed timeline.

Another disadvantage is that the commander has the sole responsibility for providing this information, and the planning process comes to a halt if he is unable to dedicate time to completing the OPORD. In continuous operations, frequent distractions (such as enemy contact in sector) demand the commander's attention. While platoon leaders could attempt to develop their own maneuver plans—based on the commander's intent—their planning process would take much longer due to their lack of experience.

This method takes too long and takes too much flexibility from the platoons, which seriously hinders executing short-notice missions.

Cooperative Planning

Advantages

Cooperative planning consists of the commander and platoon leaders, beginning at the receipt of the mission, collectively deciding on the best way for the company to fight. This provides the benefit of many eyes looking at the same problem and coming up with a variety of plans. Since the platoon leaders are being asked to conduct higher-level planning (which can be a positive development experience for them), each plan is scrutinized for its validity.

Another advantage is that using this method often results in the platoon leaders' ownership of the mission plan immediately, as the completed OPORD has their input incorporated.

Disadvantages

The disadvantage of cooperative planning is that producing the company OPORD takes longer since it is developed by a committee. As with centralized planning, it impacts by decreasing the time allowed for platoon troop-leading procedures. The process requires platoon leaders to be present for both company and platoon OPORD development, meaning that the platoon leaders are not available to respond to continuous operations demands encountered once company-level planning has begun.

This method proved the least effective of the three because it required so much leadership time—company and platoon—that it seriously limited the company's flexibility to work several missions at once. Just as with centralized planning, commanders can use other tools to receive platoon leader input instead of this time-consuming method.

Framework Planning

Advantages

With this planning method, the commander focuses on ensuring that the company OPORD includes a clear intent and the task and purpose for each platoon. He then relies on platoon leaders to develop major portions of their maneuver within the OPORD. The commander uses checks during the remainder of the preparation time to ensure that the intent is met. A major advantage of this method is that it enables platoon leaders to learn how to quickly and effectively plan their missions. This leads to improved overall planning—from company-level operations to daily combat patrols—because the platoon leaders learn what details must be considered for successful operations. Framework planning allows platoon leaders to provide their input, giving them a major role in the planning process.

Also, with this method, it takes less time to produce a company OPORD. The commander provides the necessary details for platoon planning and issues it to the platoon leaders for refinement. This allows platoon leaders a greater amount

Soldiers prepare a terrain model for an upcoming platoon OPORD.

of time for their troop-leading procedures and allows the commander time for additional contingency planning on any issues the company could face during execution.

Disadvantages

Framework planning, however, does initially take some time. If the platoon leaders are not accustomed to maneuver planning, the commander checks may take longer. Fortunately, this is an issue that can be dealt with through training, allowing the platoon leaders to gain the experience to make this second nature.

Key Elements of Framework Planning

One consideration when using this method is that it requires commanders to pay special attention to key elements of the troop-leading procedures, such as issuing a clear OPORD, requiring effective backbriefs, ensuring quality rehearsals, and conducting after-action reviews (AARs).

OPORD

For framework planning to work, commanders must focus specifically on a few aspects of the company OPORD. The first of these is the commander's intent. As a lieutenant, typically the intent statements received included generic key tasks, such as "reporting," "sensitive-items accountability," or "information operations." My company found that in order to make the intent useful to platoon leaders, more specific key tasks, such as "silent dismounted approach to reduce enemy reaction time" or "rapid exfiltration off the objective to reduce the mortar threat" were essential to make it clear how the commander wanted to fight.

When issuing tasks to subordinate units, using doctrinal terms proved essential in clearly conveying what missions the platoon leaders need to address. While this may require some training for the new platoon leaders, sticking to the doctrinal terms made the planning process faster by preventing confusion.

While platoon leaders have an important role in determining their platoon's maneuver, the commander must still include important coordinating instructions, such as restricted fire lines, recognition markers, movement techniques, and any other mission-specific instructions. This helps prevent fratricide and ensures that platoon leaders keep their plans within the commander's guidelines.

Finally, the commander provides the essential maps and graphics to conduct their planning. Typically, we included a FalconView™ satellite photo with graphics and a sketch. While the platoon leaders have an important part in the planning process, the company still owes some details to ensure that platoons have everything they need to complete their planning.

Backbriefs

After issuing the OPORD, the commander must conduct checks with the platoon leaders to ensure that they are on the right track. The most helpful check for me was the platoon backbriefs, where we ensured that the company had a solid, refined plan. Prior to the backbrief, the platoon leaders will have already issued their first warning order (WARNO) and completed their OPORD planning. During the backbrief, platoons talk through the details of their actions throughout the operation and add their platoon graphics to the company sketch.

For raiding a building, they discussed details such as specific vehicle positions, combat power dedicated to clearing each floor, sectors of fire and task organization of each element, and platoon timelines. While the commander will already have an idea of how he would fight each platoon, a platoon leader may provide a slightly different outlook on how to complete the mission. The commander can use his intent, as well as his

"Framework planning allows platoon leaders to provide their input, giving them a major role in the planning process."

experience, to determine whether the platoon leader's plan is valid. This is an excellent training opportunity, even during a deployment, for platoon leaders to understand why certain tactics are preferred in a given situation.

Additionally, the backbrief presents an opportunity for platoon leaders to propose changes to the company OPORD. This gives the commander the luxury of having more than one person find potential solutions to the same problem and leads to a more solid plan. Even if the commander denies a change, it forces him to validate the logic behind each aspect of his plan as he explains his decision to the platoon leader. With the platoon leaders hearing each other's plans, it helps them understand everyone's part in the execution of the mission and how their platoon's fight must tie into the other platoons' maneuver.

Finally, by adding each platoon's graphics to the company sketch, it ensures that each platoon has common graphics before leaving. Our company found that a solid backbrief validates the company OPORD and prevents major issues from arising in the company rehearsals.

Rehearsals

Traditional rehearsals serve as the next check. For platoon level and below, walk-through rehearsals proved to be the most effective method. At company level, however, we found that a walk-through rehearsal often made it difficult for squad leaders to see and/or hear the plans of the other platoons' squads. A map rehearsal for squad leaders and above allows the company commander to ensure that the squad leaders' understanding of their squad and platoon missions parallel his own understanding. And it allows for additional input from the squad level on any improvements to specific details within the plan.

At the rehearsal, the company provides a copy of the completed sketch from the backbrief to each squad leader, and then has each squad leader explain his part in the execution of each phase. The sketch and explanations ensure that every company leader—down to squad leader level—has a common understanding of the upcoming mission. Quality platoon and company rehearsals definitely paid off in ensuring a smooth execution.

AARs

The last key element to framework planning is to conduct an AAR, which will ensure that future mission plans are conducted faster and executed smoother. Initially, I only required leaders from the platoons involved in the mission to attend; however, we learned through experience that platoons without representatives at the AAR would repeat the mistakes that had been addressed at the previous AAR. I then required each platoon to have a representative at every company AAR, regardless of whether they participated in the mission or not. This allowed platoons to learn from each other's mistakes and successes.

Additionally, the AAR allowed leaders at all levels to bring up details that had not been addressed prior to executing the mission. This identified—to the platoon leaders and myself—what else should be addressed in the OPORDs to prevent confusion on future missions. The company's ability to honestly evaluate its own performance and identify areas for improvement allowed it to improve both its planning and execution on following missions.

Summary

Centralized planning ensures that the commander's intent is met, but it presents problems when faced with a compressed timeline. Cooperative planning develops a unified plan, but requires a great amount of leader time. Framework planning provides the mission intent with a task and purpose for each element and relies on platoon-level planning, which proved to be the most effective method for this company commander and company.

When presented with the mission of conducting a raid with Special Forces in a few hours, I was able to quickly provide the OPORD to the platoon leaders. As they conducted their platoon planning, I finalized coordination with external assets and received a thorough backbrief with 4 of the 5 hours still available for rehearsals and final preparations.

This short-notice operation captured terrorists and a cache of weapons, explosives, and ammunition. It also provided intelligence that led to additional related targets, which we executed in the coming weeks. Preparing for this mission was demanding; however, framework planning provided us time to effectively plan, coordinate, and execute the mission with confidence.

Captain LaMarca's assignments include battalion planner for the 91st Engineer Battalion and company commander for Charlie Company, 91st Engineer Battalion, and Echo Company, 1st Battalion, 8th Cavalry. In Iraq, his company executed raids, as well as constructed protective obstacles around polling centers prior to the Iraq election. Upon returning to the United States, he was deployed to New Orleans to assist with the Hurricane Katrina relief efforts.

Engineer Doctrine Update

By Lieutenant Colonel Edward R. Lefler and Mr. Les R. Hell

This article provides an update to the Engineer Regiment on doctrinal publications. Significant content changes due to lessons learned from recent operations, the transition to a modular force, and changes in joint and Army capstone and keystone manuals are being worked. The old 5-series manuals will be modified to a new 3-34.*xyz* system that complements the Army and joint hierarchies.

Value of Doctrine

Doctrine touches all aspects of the Army. It links theory, history, experimentation, and practice. It provides an authoritative statement about how military forces do business, insights and wisdom gained from collective experience with warfare, and a common language to describe it. It is a guide to action, not "hard-and-fast" rules. Doctrine provides the intellectual tools leaders use to solve military problems quickly and effectively. By establishing common ways of accomplishing military tasks, it helps standardize operations and enhance readiness. Doctrine facilitates clear thinking and assists a commander in determining the proper course of action during the decision-making process. It facilitates communication among Soldiers and contributes to a shared professional culture. It forms the basis for curricula in the Army education system.

Effective doctrine for all levels explains how Soldiers and leaders expect to fight and operate. It is based on experience—an estimate of what lies ahead. Doctrine provides fundamental principles by which military forces and their elements guide their actions in support of national objectives. It is authoritative, but requires judgment in application.

Principles, Tactics, Techniques, and Procedures

Doctrine includes fundamental principles, tactics, techniques, and procedures. *Principles* form the basis that guide the actions of Army forces in support of national objectives. They provide the foundation for initiatives designed to help leaders be adaptive, creative problem solvers. *Tactics* address the employment of units in combat. The actual application of tactics is highly circumstantial; it is both art and science. Tactics vary constantly with the situation. *Techniques* are the general and detailed methods used by troops and commanders to perform assigned missions and functions, specifically the methods of using equipment and personnel. *Procedures* are standard and detailed courses of action that describe how to perform a task. Techniques and procedures are the lowest level of doctrine. They are specific to particular types of units based on organization, equipment, and environment.

Capstone Field Manuals

The Army has two capstone field manuals (FMs)—FM 1, *The Army*, and FM 3-0, *Operations*—that form the apex of the Army's doctrine hierarchy. Together, they establish the framework for a range of supporting doctrine. Army keystone doctrine is organized around foundations established in FM 3-0. Supporting manuals provide additional detail for keystone manuals.

FM 3-0 establishes the Army's fundamental principles for applying land power as part of an interdependent joint force. It provides a framework for action and decision making at all levels. It is not meant to be, and must not be, a substitute for thought. The aim is to establish guidelines for leaders to direct operations while allowing enough freedom for bold, creative initiative in any situation.

Engineer Doctrine

The Engineer Regiment has 59 field manuals in its library (the second largest number of any proponent organization in the Army). Of these, 4 are current; 35 require assessment for relevancy, accuracy, and content; and the remaining 20 are under revision or require revision. Our keystone manual that supports the Army's hierarchy is FM 3-34, *Engineer Operations*. The remaining 58 engineer field manuals are subordinate to FM 3-34.

As the Army embraces more technology in its units, there must be ways to make rapid changes in doctrine that will accommodate changes in hardware, software, and procedures. The process of developing Army doctrine is a decentralized operation that involves the collective and cooperative effort of a large number of proponent schools and centers and targeted

subject matter experts (SMEs). Our objective is to achieve total integration of engineer doctrine with Army proponent schools and centers, as well as with multiservice, joint, and allied doctrine. We strive to ensure that our doctrine has credibility and legitimacy because it is developed with the "user" in the "field Army" in mind. This is achieved through extensive staffing, targeted SMEs, Army schools and centers, and joint partners.

Key Developmental Issues

For doctrine to be effective, it must be consistent and applicable at all levels and in all environments. Engineer doctrinal revisions address and incorporate all applicable new or revised joint and Army capstone and keystone publications, the current operational environment, new technology, new materiel, new organizations, lessons learned, and validated concepts. There have been many emerging and key developmental issues to address in engineer doctrine. Following are some primary ones of immediate concern:

- Defining the Future Engineer Force (FEF) capabilities and organizations. Augmentation at brigade combat team level for engineer support (engineer battalion headquarters, mobility operations) and maneuver support is needed.
- Updating existing improvised explosive device (IED) doctrine with rapidly changing tactics, techniques, and procedures, and incorporating the right lessons learned, new materiel, and training.
- Transitioning the Army away from the battlefield operating systems to the more joint-aligned warfighting functions (WFF). Mobility and countermobility universal tasks are proposed with movement and maneuver WFF. Survivability universal tasks are aligned with the protection WFF. General engineering is a subtask of the sustainment and logistics WFF. Geospatial engineering is aligned with the intelligence WFF.
- Defining maneuver support and integrating it in Army keystone and capstone doctrine.
- Defining and embedding infrastructure reconnaissance throughout engineer and Army doctrine.
- Defining base camp standards and coming to an agreement between all services on one standard.
- Reintegrating the five functional areas (conduct combined arms breaching, conduct clearing, conduct gap crossing, construct, and maintain combat roads and trails) of mobility operations back into doctrine.
- Defining the types of gap crossings (deliberate, hasty, and covert) and establishing the linkage between gap crossing and mobility operations.
- Revising our approach to engineer reconnaissance to a more combined arms approach with better resolution on the differences between the tactical and technical reconnaissance, discussing engineer reconnaissance teams, explaining and highlighting reachback and other technical augmentation, reintroducing a discussion on tunnel reconnaissance, and adding infrastructure and environmental reconnaissance (assessment and survey) into publications.
- Redefining essential mobility and survivability tasks to essential maneuver support tasks to synchronize and integrate morethan just mobility and survivability operations.
- Defining and detailing clearing operations (route and area) in doctrine.
- Defining and detailing search operations in doctrine.
- Assessing and updating current information on urban explosive breaching and bringing our procedures in line with the United States Marine Corps.
- Redefining and establishing a consistent obstacle numbering system. If done correctly, the relationship between the North Atlantic Treaty Organization (NATO); American, British, Canadian, and Australian (ABCA); and U. S. standards can be complementary.

Numbering and Hierarchy

Figure 1 shows the basic hierarchy of engineer manuals with the revised numbering system. FM 3-34 and its eight subordinate manuals directly relate to and support engineer battlespace functions (combat engineering [mobility, countermobility, and survivability], general engineering, and geospatial engineering), coupled with the organizational and supporting reference manuals.

In August 1997, the United States Army Training and Doctrine Command (TRADOC) initiated a program to revise the Army doctrine hierarchy to link it by function and number to the joint publication system. This resulted in a tiered systematic approach that delineates between Army capstone and keystone doctrine and aligns those manuals with their corresponding joint manuals. The remaining manuals consist of proponent and branch-specific doctrine and publications. While the revised numbering system was approved and is in place at some levels of the Army, implementation has been a slow process. The renumbering of older manuals will occur during the normal revision cycle.

Figure 2, page 32, is an example of the originally planned transition to the new numbering system—a detailed resolution for each manual. However, due to the dynamics of the ever-changing environment, it was determined that a simplified version would better serve the Regiment. As manuals are updated, the FM 3-34.*xyz* numbering system will be used for the majority of the manuals, not the example shown in Figure 2. The 100- to 300-level series manuals will be linked to combat engineering functions, the 400- to 500-level series manuals will be linked to general engineering functions, and the 600-level series manuals will be linked to geospatial engineering functions. The organizational manuals will be

Army Engineer Publications Hierarchy

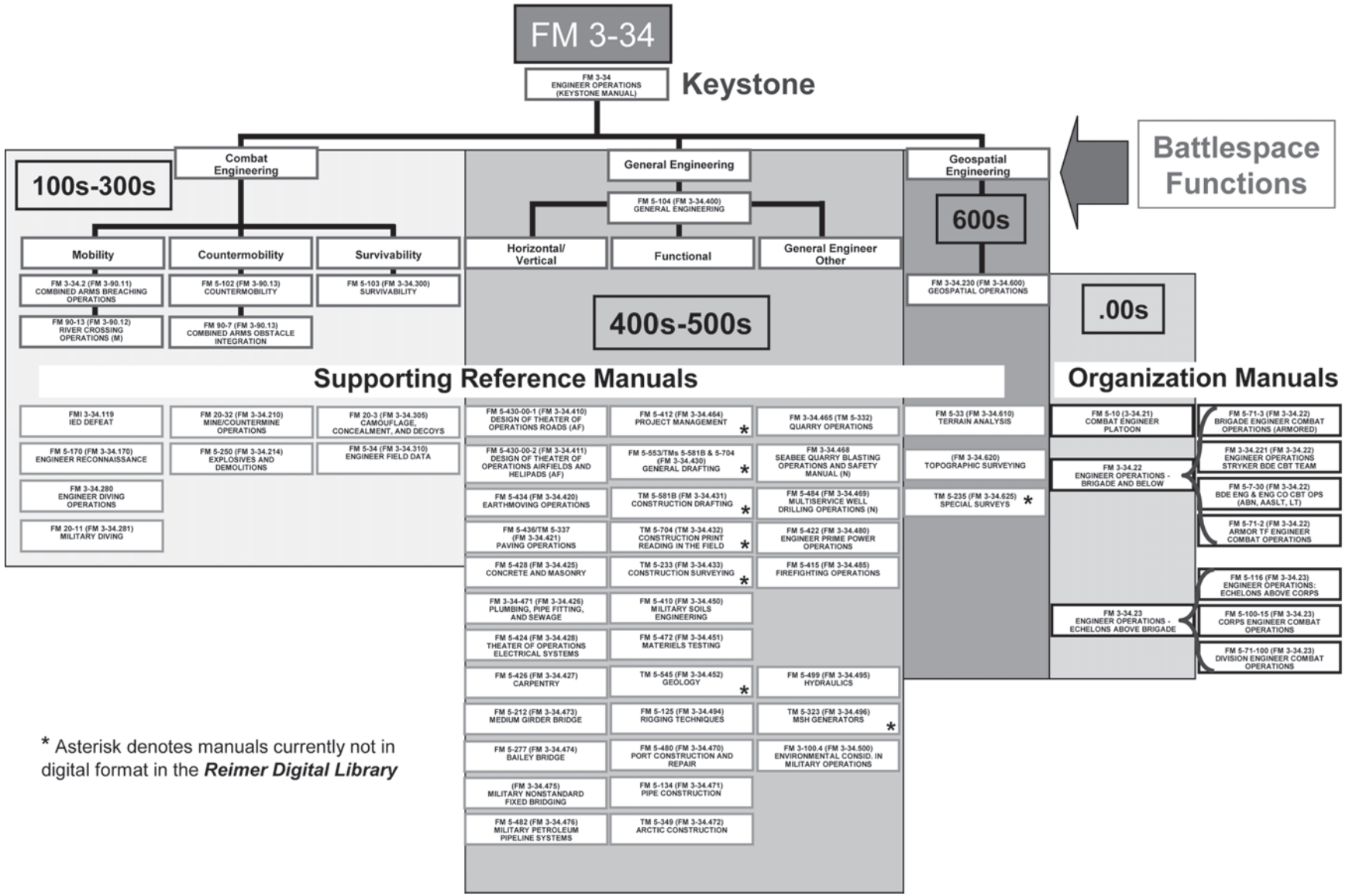


Figure 1

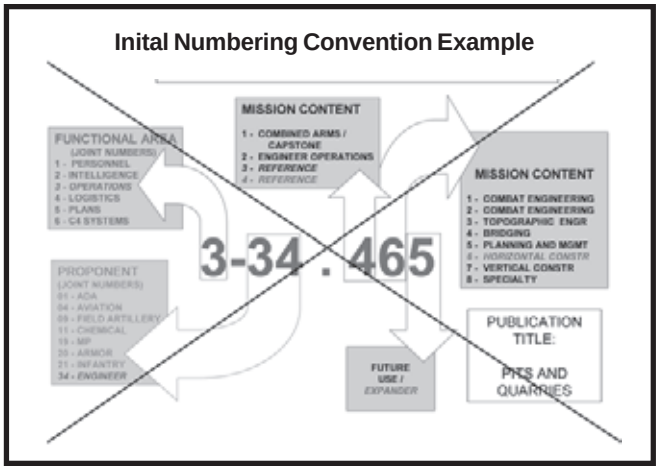


Figure 2

renumbered to 3-34.*xy*, and many of our key manuals that directly relate to combined arms will be renumbered to FM 3-90.*xy* (such as FM 3-90.11, *Combined Arms Mobility Operations*; FM 3-90.12, *Combined Arms Gap Crossing Operations*; and FM 3-90.13, *Combined Arms Obstacle Integration*).

Recently published manuals using this new numbering system are—

- Field Manual Interim (FMI) 3-34.119, *IED Defeat*, September 2005.
- FM 3-34.221, *Engineer Operations - Stryker Brigade Combat Team*, January 2005.

Ongoing and Near-Term Doctrine Actions

Doctrinally, as you can see, the Regiment and the Army as a whole have a lot on their plate. Engineer manuals currently being updated are listed in the following paragraphs, along with the ongoing integration efforts with Army and joint publications (JPs).

Currently 14 publications are being revised in support of the Global War on Terrorism and the modular transformation. Primary changes relate to the key developmental issues already mentioned. In Figure 3, those 14 publications are highlighted in the boxes outlined in red. A full-color copy of Figure 3 is posted to the United States Army Engineer School, Doctrine Development Division, Web site at <*http://www.wood.army.mil/DDD*>.

Engineer Publications

- FM 3-90.11 (currently FM 3-34.2), *Combined Arms Mobility Operations*.

  Status: Final draft.

  Revision highlights: FEF modularity, mobility (breaching, clearing, gap crossing, combat roads and trails, forward aviation combat engineering [FACE]), IEDs, WFF; maneuver support, urban breaching, and essential maneuver support tasks.

- FM 3-90.12 (currently FM 90-13), *Combined Arms Gap Crossing Operations.*

  Status: Adjudicating the comments from the initial draft staffing to the field.

  Revision highlights: FEF modularity, reconnaissance, gap crossing definitions, WFF, and maneuver support.

- FM 3-90.13 (currently FM 90-7), *Combined Arms Obstacle Integration*.

  Status: Final draft.

  Revision highlights: Obstacle numbering, FEF modularity, WFF, and maneuver support.

- FM 3-34, *Engineer Operations.*

  Status: Initiating process to revise.

  Revision highlights: FEF modularity, WFF, maneuver support, alignment to capstone doctrine, assured mobility, and essential maneuver support tasks.

- FM 3-34.22 (currently FM 3-34.221, FM 5-71-2, FM 5-71-3, and FM 5-7-30), *Engineer Operations - Brigade Combat Team and Below.*

  Status: Writing the initial draft.

  Revision highlights: FEF modularity, WFF, essential maneuver support tasks, and assured mobility.

- FM 3-34.300 (currently FM 5-103), *Survivability.*

  Status: Final draft.

  Revision highlights: Protection, hardening, WFF, and essential maneuver support tasks.

- FM 3-34.170 (currently FM 5-170), *Engineer Reconnaissance*.

  Status: Writing the initial draft.

  Revision highlights: Infrastructure reconnaissance (assessment and survey), environmental reconnaissance (assessment and survey), and engineer reconnaissance teams and reachback.

- FM 3-34.210 (currently FM 20-32), *Explosive Hazards Operations.*

  Status: Editing the final approved draft.

  Revision highlights: Explosive hazards, explosive ordnance clearance agents, search operations, IED operations, clearance operations, landmine policy, and mine dogs.

- FM 3-34.400 (currently FM 5-104), *General Engineering.*

  Status: Final draft.

  Revision highlights: Infrastructure reconnaissance, FEF modularity, homeland support, reachback, and WFF.

- FM 3-34.214 (currently FM 5-250), *Explosives and Demolitions.*

  Status: All final draft comments are adjudicated; preparing the final approved draft.

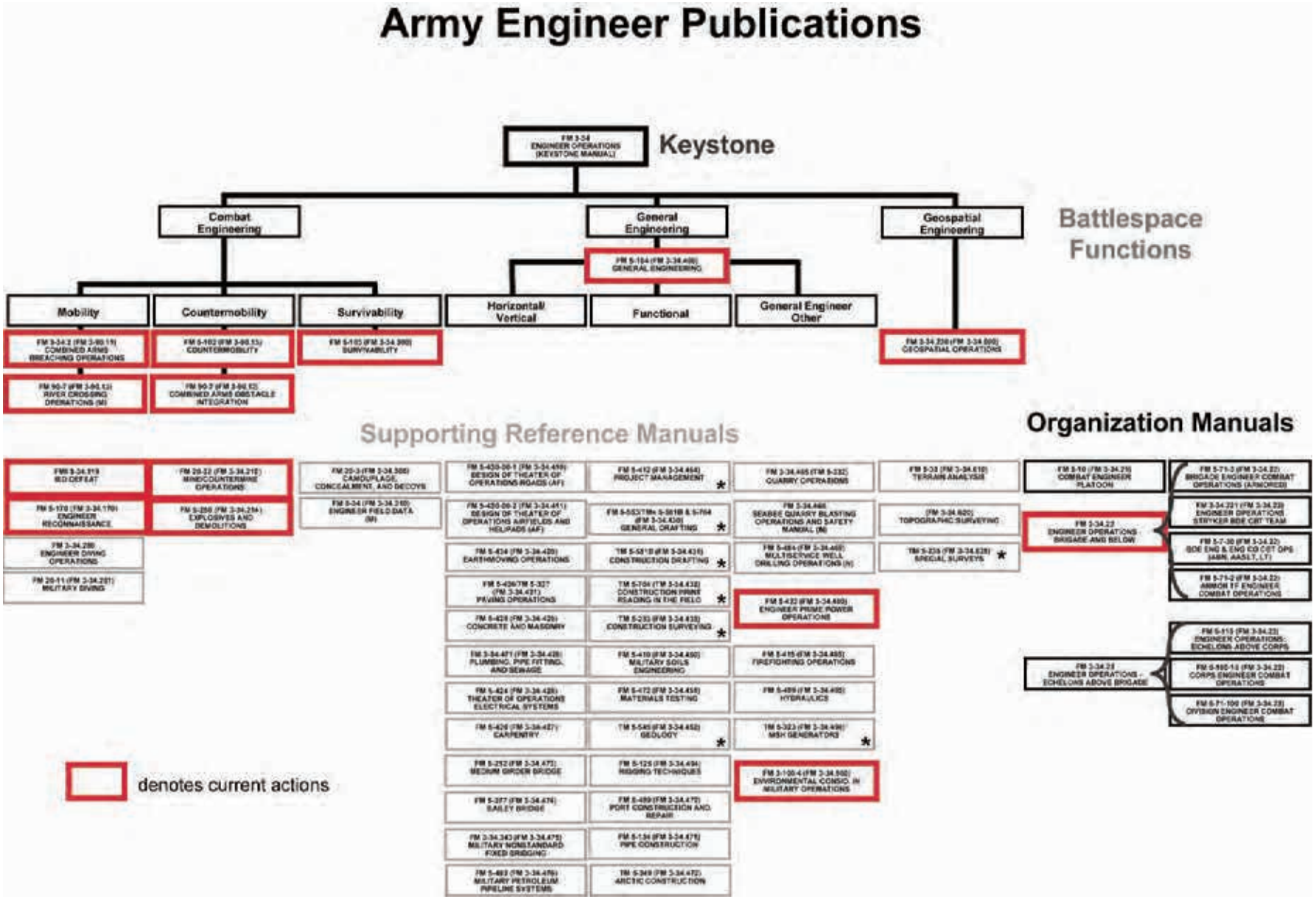

Army Engineer Publications
Keystone
Combat Engineering
General Engineering
Geospatial Engineering
Battlespace Functions
Mobility
Countermobility
Survivability
Horizontal/ Vertical
Functional
General Engineer Other
Supporting Reference Manuals
Organization Manuals
denotes current actions

Figure 3

Revision highlights: Urban breaching, neutralization terminology, and modernized demolition initiators.

- FM 3-34.480 (TM 5-422), *Engineer Prime Power Operations.*

  Status: All final draft comments are adjudicated; preparing the final approved draft.

  Revision highlights: Equipment and capabilities.

Related Army Publications

- FM 3-0, *Operations.*

  Status: Writing initial draft.

- FMI 5-0.1, *The Operations Process.*

  Status: Completed February 2006 and posted to the Army Knowledge Online (AKO) Web site.

- FMI 3-91, *Division Operations.*

  Status: Doctrine review approval group (DRAG) version currently being staffed with suspense of 6 March 2006; action officer DRAG adjudication conference, 15-17 March 2006.

Joint Publications

- JP 3-0, *Joint Operations.*

  Status: Final coordination of draft adjudication.

- JP 3-34, *Joint Doctrine for Engineer Operations.*

  Status: Writing revision second draft.

- JP 3-15, *Joint Doctrine for Barriers, Obstacles, and Mine Warfare.*

  Status: Writing Army engineer input to revision first draft.

- JP 2-03, *Geospatial Intelligence Support to Joint Operations.*

  Status: Revision second draft in adjudication.

- *Joint Forward Operations Base Force Protection Handbook.*

  Status: Final draft edition for the quick-reaction test; starting process to integrate into an Air, Land, Sea Application (ALSA) multiservice tactics, techniques, and procedures publication through the Joint Allied Doctrine Division analysis and approval.

Regiment Involvement

As previously mentioned, keeping a diverse and large inventory of manuals current requires effort from across the Regiment to ensure that the engineer library is maintained, relevant, and pertinent. What good is it to have a manual on *Arctic Construction* when it is not used, current (it was written in 1962), or relevant? Surely there have been numerous advances in arctic construction in the last 40 years.

Maintaining our doctrinal library is critical to the Regiment because it integrates engineer doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF). It is our training base for educating Soldiers and officers, as well as a ready reference while deployed and performing missions that might not be routine. Numerous efforts are ongoing throughout the Regiment. The Engineer School challenges you to participate in the doctrine development process to produce relevant and current doctrine for our Regiment. Drafts are staffed through the AKO portal (sergeant first class and above and major and above). If you would like to become involved in the process, or if you have unique expertise that would make you the perfect SME candidate, contact the Engineer School Doctrine Development Division at <*http://www.wood.army.mil/DDD*> or call commercial, 573-563-7332/8161; or DSN, 676-7332/8161.

Conclusion

While many initiatives are in the works to change the way we write, produce, and access Army doctrine, there is still a need to manage, review, and update existing manuals to ensure that they are relevant and valuable to our Regiment. We must continue to integrate current engineer changes into existing and new manuals. Participation in the doctrine development process—by targeting SMEs and working groups drafting these documents with key engineer and maneuver-supporting perspective—is essential. With your help, the process will meet the doctrinal needs of the Regiment and the Future Force by maintaining a relevant, current, consistent, and integrated library.

Lieutenant Colonel Lefler is the Chief of the Doctrine Development Division at the United States Army Engineer School, Fort Leonard Wood, Missouri. He is a registered professional engineer in Nebraska and a Project Management Professional.

Mr. Hell is the Deputy Chief of the Doctrine Development Division at the United States Army Engineer School, Fort Leonard Wood, Missouri.

If you would like to become involved in the doctrine development process, contact the Engineer School Doctrine Development Division at <*http://www.wood.army.mil/DDD*> or call commercial, 573-563-7332/8161; or DSN, 676-7332/8161.

IED AWARENESS TRAINING:

ARE WE PREPARING OUR JUNIOR LEADERS FOR SUCCESS?

By Captain Therese L. Obidinski

As the Senior Engineer Instructor for the Combined Arms Division, Fort Sill, Oklahoma, I teach Field Artillery Officer Basic Course (FAOBC) students and serve as the 30th Field Artillery Regiment's improvised explosive device (IED) subject matter expert. My mission is to advise the commander on the status of IED training and resources for the Captain's Career Course (CCC), Officer Basic Course (OBC), Basic Officer Leadership Course (BOLC), and Warrant Officer Course.

After much research on the ever-changing environment of IEDs, one crucial question was raised: Are we really preparing our junior leaders for success when they arrive at their unit, and ultimately, when they deploy? This is a rather broad question; part of the solution lies in adapting to tactics, techniques, and procedures (TTP) used by the enemy and another part on training a brand new second lieutenant—who already has a rucksack overflowing with mandated basic branch program of instruction (POI) requirements—on this prolific subject. To answer this question, we had to consider another approach that focused on the purpose of FAOBC and the critical IED information that should be taught at the student level with available time and resources.

The initial focus started with the purpose and scope of FAOBC. At first, the answer seemed simple. These students are not here to be engineer or armor officers. They are here to be field artillery officers, and their mission is to understand the role of the fire support officer (FSO) and how that role relates as a member of the combined arms team. These junior leaders will learn how to support the maneuver commander. However, they also will learn that despite their primary responsibility as an FSO, they could be directed to lead a security patrol, run a checkpoint, or even provide security in a convoy.

As these junior leaders participate in these other missions, they will encounter IEDs. According to a *Stars and Stripes* article dated 7 December 2005, as of 26 November 2005, IEDs caused approximately 39 percent of the 2,100 U.S. fatalities in Iraq. That's 821 Soldiers. The same article also stated that IEDs, along with other explosive devices, were responsible for about 50 percent of U.S. hostile deaths in Iraq, and explosive devices accounted for 8,452 of the U.S. troops wounded in Iraq—about 53 percent of the total number of hostile-fire wounds.

Unfortunately, the casualty statistics—and the enemy's methods—change every day; it is difficult to keep abreast of every change. If you browse Web sites dedicated to the fallen in Iraq, not only do you see the list of names but also the large number of officers and especially junior officers listed among the fallen. With the 19-week training cycle for OBC and 7-week training cycle for BOLC II, one may ask: How do we prepare these junior leaders for the challenges that face them, and what tasks should we train?

Training

The United States Army Field Artillery School has focused resources on the new Field Manual Interim (FMI) 3-34.119, *IED Defeat*, dated September 2005, and the new Convoy Survivability Training Support Package (TSP), which outline IED collective and individual training tasks. BOLC II training on the Convoy Survivability TSP started in January 2006 and centers around two tasks: *Identify Visual Indicators of an IED* and *React to an IED*.

There are 14 tasks to train, and each task has its associated subtask. The challenge of IED training appears daunting at first. However, it is manageable, and we as leaders must focus on targeted training. We can't train everything in a school environment. These officers will receive more in-depth training when they transition to BOLC II and unit-specific training when they arrive at their follow-on assignment. Schoolhouse instructors can play a larger role in assisting commanders in the field if we train lieutenants more on basic IED tasks and provide officers with a more logical, methodological approach when identifying, assessing, and reacting to IEDs. This involves communication with leaders on the ground through tools such as open discussion forums <*www.companycommand.com*>, the secret internet protocol router network (SIPRNET), the Center for Army Lessons Learned (CALL), and other feedback mechanisms to determine what leaders expect from lieutenants when they arrive at their units and, specifically, what level of IED awareness training we can train here from shared real-world experiences.

Resources

The United States Army Engineer School at Fort Leonard Wood, Missouri, is the proponent for IED training and procurement. The primary training support centers (TSCs) responsible for producing training aids are Fort Gordon, Georgia; Fort Jackson, South Carolina; Fort Knox, Kentucky; Fort Benning, Georgia; and Fort Lewis, Washington (regional). The Fort Sill TSC provides resources and training aids to Oklahoma (all counties), Arkansas (all counties), and Texas (all counties north of Wichita Falls). Just as the Fort Sill TSC supports other units outside of its installation, other TSCs have their area of responsibility. Training aids are assigned on

a priority basis, usually going to units that have upcoming deployments. Coordination for training aids can be facilitated through local TSCs. It is there to support training and will do the necessary requisition or coordination for the training aids and devices required.

Although there are IED training aids available, many private contractors bid for Army contracts to develop new training aids to keep pace with the contemporary operating environment. The United States Army Program Executive Office for Simulation, Training, and Instrumentation (PEO-STRI) is responsible for developing and fielding new training devices and systems.

The figure below shows the new Tactical Improvised Explosive Device 2 (TIED2) kit, an interim solution that is being fielded across the force to assist units with realistic training. The kit simulates the basic components of an IED, with a remote-controlled device and a radio-frequency transmitter. The system uses talcum powder to achieve a smoke-like signature effect. Compressed carbon dioxide (CO_2) in tanks—the same concept as a paintball gun—is used to simulate the effects of a roadside bomb and other types of IEDs, each with its own unique signature effects.

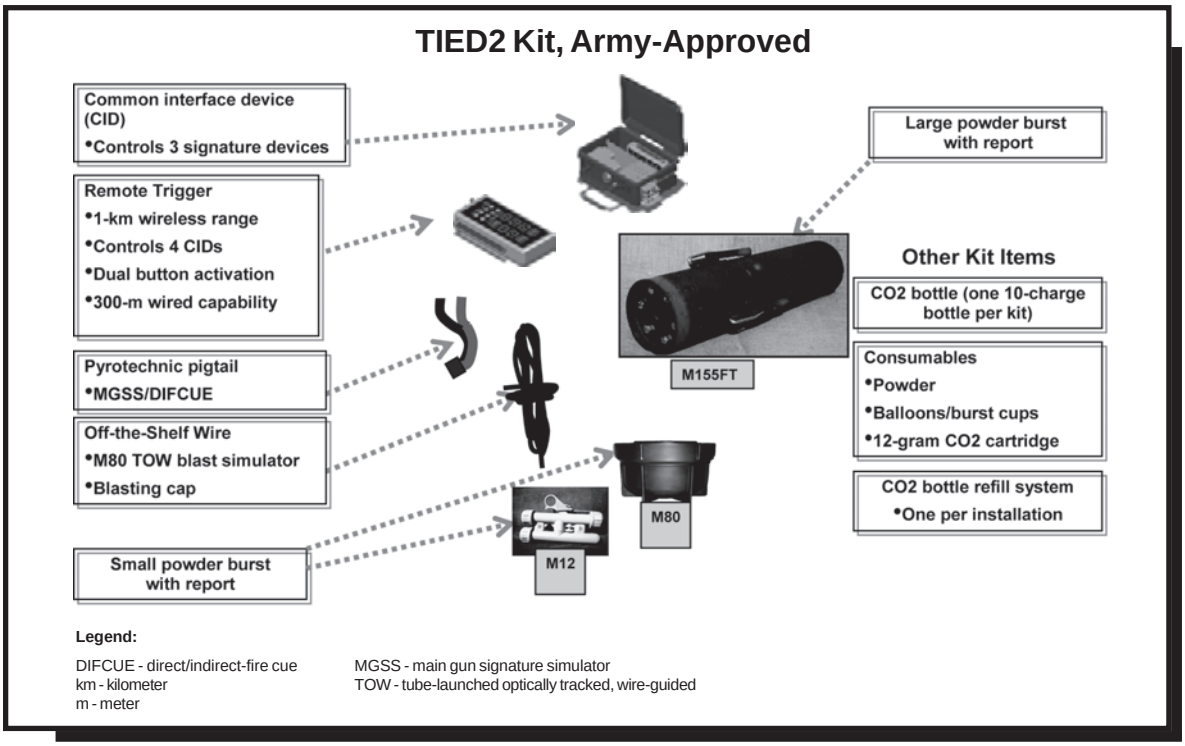
Another system developed at Fort Leonard Wood is the IED Effects Simulation (IEDES) Kit. The United States Army Training and Doctrine Command (TRADOC) validated the requirement, and the requirements document is being staffed at Department of the Army for funding in the 08-13 Program Objective Memorandum. IEDES provides a realistic training capability using different configurations of small, medium, large, and extra large munitions effects. The overall intent of the system is to help Soldiers and leaders plan, prepare, and react to IED effects.

It is important for all leaders and trainers to have a basic understanding of the TSC request process and to distinguish between Army-approved versus non-Army-approved systems. Trainers need to identify resource requirements early and submit requests through S-3 channels to consolidate and track requests. Higher headquarters should coordinate through local TSCs for requests. If training aids, devices, simulators, and simulations (TADSS) are purchased using Operations and Maintenance, Army (OMA) funds, they have to be supported using OMA funds throughout their life cycle. In other words, if you purchase items through a vendor directly, you will drain your own unit funds for restocking those items. If items are not ordered through the Army system, the Army has no record that there is a need for specific training aids. Therefore, the Army will not authorize the unit additional items (they are not on the property books), restock those items and, most importantly, units will not be funded by the Army for those items.

Currently PEO-STRI is fielding the TIED 2 (interim solution) on an Army Training Support Command-approved distribution plan. TIED 2 was designed to meet a specific need to bridge the gap in planning, preparing, and reacting to IEDs in a specific operational theater. At this time, the only validated and approved TADSS is the IEDES. If units procure any other devices, it is done at their expense. In addition, using devices that are not validated and approved is seriously risking the safety of the Soldiers conducting the training.

Implementation

Currently, the Field Artillery School is involved in preparing a block of instruction on IED awareness training across the Regiment. This training will be



inserted in a field environment where it does not distract from mandated basic branch requirements. FAOBC students currently receive IED awareness training that draws upon real-world examples. We are also in the process of developing a plan to integrate and evaluate this training through situational training exercises during the FAOBC fires and effects capstone field training exercises. BOLC II instruction will evaluate IED training during convoy survivability operations and forward operating base exercises (FOBEXs).

Conclusion

The integration of IED awareness training—determining where to insert classes and revising and evaluating training—is an ongoing process. The enemy's determination to use IEDs remains strong, and the methods are constantly evolving. If we can teach these junior officers basic methodologies, critical thinking, and the basics of identifying, assessing, and reacting to the IED threat, then we are preparing them for success, no matter what the task. According to the 2005 *Army Strategic Planning Guidance*, "Operation Iraqi Freedom and Operation Enduring Freedom have shown that insurgencies can arise out of regime change and can hinder follow-on stability operations. The current enemy has adopted asymmetric strategies and tactics that enable it to mitigate U.S. strengths. U.S. forces must adapt to the new strategic environment and develop proficiencies that counter these tactics."

It is important to provide junior leaders with the tools to adapt and to counter these asymmetric strategies and tactics in a nonthreatening environment, saving valuable training time when they arrive at their follow-on assignments. The time we dedicate to IED and leader training here at the Field Artillery School will help to familiarize junior leaders with the many challenges they will face in theater and in their military career. Focusing on leader development and critical thinking skills will provide the Army and the nation with more adaptive and responsive leaders at all levels.

Captain Obidinski is assigned to the 1-30th Field Artillery Regiment, Fort Sill, Oklahoma, and is the Senior Engineer Instructor, Combined Arms Division. Previous assignments include Commander, D Company, 3d Battalion, 10th Infantry Regiment, Fort Leonard Wood, Missouri, and Commander, HHC (P), Warrior Brigade, Fort Polk, Louisiana. She holds a bachelor's from the United States Military Academy at West Point and a master's in geology and geophysics from the University of Missouri-Rolla.

AISI Maintenance: Check the Batteries

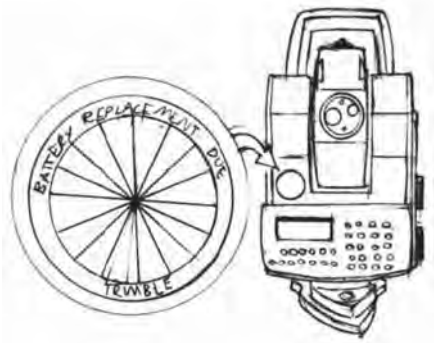
By Mr. Danny A. Carter

Some engineer units are finding after they deploy that their automated integrated surveying instruments (AISIs) aren't working right because the batteries need to be replaced. Don't let that happen to you! Survey the batteries on all of your AISIs to see if their internal batteries have been replaced in the last three years. If not, the batteries need to be replaced. There are two ways to check:

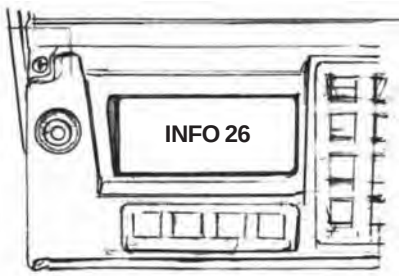
- Look at the Trimble Battery replacement due date sticker just below the distance meter head.
- Turn the power on and look for INFO 26 in the display. If it is, then the batteries need to be replaced as soon as possible. If you continue to operate the AISI in an INFO 26 condition or with expired batteries, you risk total loss of the AISI's memory or AISI failure.

You can't replace the batteries yourself. An authorized service center must do it. To get instructions and approval for AISI battery replacement, contact the Communications-Electronics Command at DSN 987-5472 or commercial (732) 427-5472; e-mail <*danny.carter@mail1.monmouth.army.mil*>; or DSN 992-9982 or commercial (732) 532-9982, e-mail <*hilda.thomas@mail1.monmouth.army.mil*>. They will need the serial numbers of your AISIs.

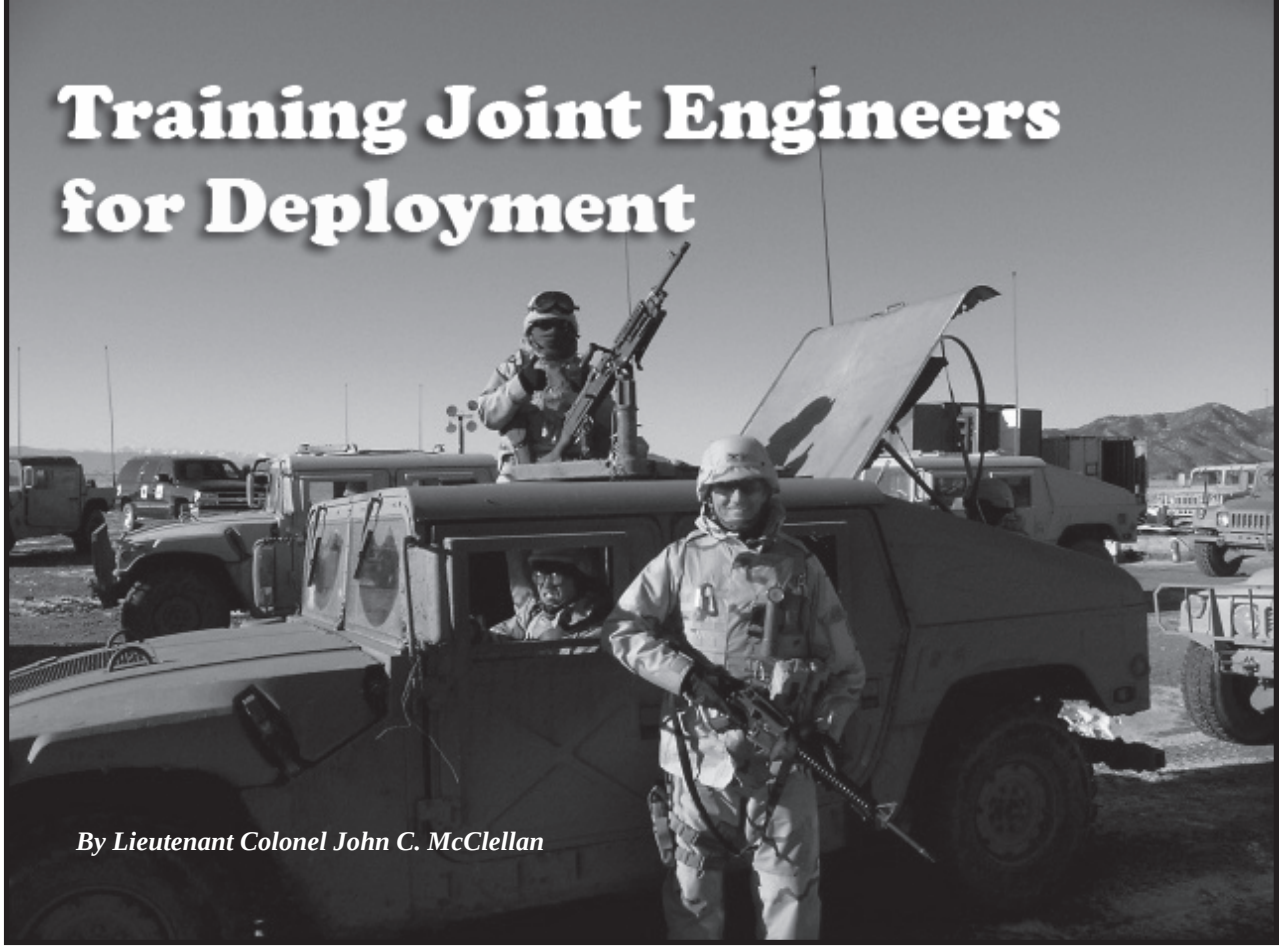
Look at replacement due date sticker...



...or check for INFO 26 in the display



Training Joint Engineers for Deployment



By Lieutenant Colonel John C. McClellan

In the past year of the nation's ongoing Global War on Terrorism, United States Air Force personnel have been called on more and more to deploy to overseas billets in support of United States Army ground forces in Iraq and Afghanistan. These positions include numerous engineer specialties such as explosive ordnance disposal (EOD), engineer design teams, utility teams, and firefighters.

In order to prepare these joint fighters for the complex, dangerous ground combat environment in both Iraq and Afghanistan, the 2d Brigade, 91st Division (Training Support) (2-91st TSB), conducts the Army's 3-week Combat Skills Training (CST) course at Fort Carson, Colorado. The 1st Battalion, 361st Engineer Regiment (Task Force Redhawk), is currently executing its 15th CST rotation, training another group of deploying Air Force personnel how to *shoot, move, communicate,* and *save lives.*

Task Force Redhawk, the 2-91st TSB's engineer training battalion, was originally designed to help train and advise United States Army Reserve and Army National Guard combat engineer and bridging units in the brigade's area of operations. Following 9/11, the task force observer-controller/trainers (OC/Ts) initially provided mobilization assistance and collective training to many of the engineer companies and battalions. In the 11 months from May 2004 to April 2005, the battalion deployed with the brigade to Fort Bliss, Texas, to conduct postmobilization training for two complete brigade combat teams. While these combined arms teams included organic engineers, the task force's role expanded to encompass urban operations—including dismounted infantry and mounted patrol operations—for maneuver task forces, supporting engineers and maintenance formations (see "Urban Operations Training at the Power Projection Platform 'Welcome to Al Wadi,'" *Engineer,* July-September 2005, pp. 7-10).

Returning to Fort Carson in April 2005 with a highly professional and experienced OC/T corps, Task Force Redhawk assumed primary responsibility for the brigade's Joint Service Training Oversight (JSTO) Program, which includes the Air Force CST course. The mission not only would include instruction in basic combat skills but also would teach Air Force personnel to form combat teams capable of executing Army battle drills and operating while attached to Army ground forces. The task force completed seven CST rotations, training more than 1,000 Airmen by the end of 2005.

Feedback from deployed Air Force engineer leaders from the JSTO-13 class that graduated in December 2005 (shown as quotations throughout this article) has validated the importance of team building during the CST course. Typically, the Airmen filling these joint engineer teams are drawn from bases all across the world. The CST course is often the first opportunity officers and noncommissioned officers (NCOs) have to learn the personalities and assess the capabilities of those they will be with in theater.

"Training together as a team helped us to be ready when we arrived. We knew our team. If we just showed up in the area of responsibility from all our different bases, we would have had to come together as a team. Your training put us three weeks ahead of where we would have been."

Another key aspect of the training is the cultural shift for Air Force personnel who must become quickly immersed in Army doctrine and tactics, techniques, and procedures (TTP). Army troop-leading procedures (TLP), precombat inspections (PCIs) and precombat checks (PCCs), battle drills, and combat patrol standing operating procedures (SOPs)—ingrained in Army Soldiers from basic training forward—can be foreign and confusing to joint service members.

"It taught us how to talk Army. We are far outnumbered by Army where we work. We replaced an Army National Guard unit, and it helped to know something about Army culture so we could hit the ground running. We are working directly for the Army. It helped me fit in quickly among the Army command sergeants major at other camps."

More than just understanding Army acronyms, deploying Air Force leaders also need to understand Army tactical mission planning and execution. Therefore, the CST course includes a daylong seminar on the military decision-making process, Army TLP, and PCIs. Beyond Army "culture shock," deploying Airmen must also understand the culture and customs of two vastly different Muslim societies. During the CST course, Air Force personnel receive briefings on customs, culture, and a threat situation tailored to their theater location.

The Airmen in the current CST class will be stationed throughout Iraq and Afghanistan in a variety of roles. Some of these engineers will occupy field offices within Army facilities, while others—like EOD teams and firefighters—will operate directly out of Army forward operating bases (FOBs) in areas of operations where the threat of insurgent attack from improvised explosive devices (IEDs) is a daily reality. The CST course is designed to prepare everyone deploying for this dangerous environment. Expert counter-IED instruction from Task Force Redhawk's engineer OC/Ts is the first subject taught in the CST program. The Airmen are then issued a "training fleet" of Army M1114 high-mobility multipurpose wheeled vehicles (HMMWVs) and must operate in a simulated IED-threat environment for the remainder of the training at Fort Carson.

Airmen in the CST course receive 4 days of intensive Army Combat Lifesaver (CLS) training. While the Air Force teaches basic first aid, similar to Army buddy aid, Airmen in CLS learn advanced first aid techniques. The CLS phase includes familiarizing Air Force personnel with the Army medical evacuation (MEDEVAC) process, including the standard 9-line MEDEVAC request.

"We used the 9-line procedure when a bus rolled over just outside of camp. Training was important because 1 passenger was killed and 21 were wounded."

Airmen in the CST course then complete several more days of basic Army combat skills, including day/night driver's training on the HMMWV, Army communication procedures and equipment, and mounted/dismounted land navigation. Again, most Airmen are unfamiliar with basic Army small-unit equipment such as the Single-Channel Ground-to-Air Radio System (SINCGARS), frequency-modulated (FM) radio, and Precision Lightweight Global Positioning System (GPS) receiver (PLGR). Similarly, Air Force officers and NCOs tend to be more familiar with joint operations graphics than with the tactical maps used by most Army combat patrols. Task Force Redhawk's land navigation training also includes terrain analysis and the traditional engineer emphasis on understanding terrain through observation and fields of fire, avenues of approach, key terrain, obstacles, and cover and concealment (OAKOC) factors.

Next, JSTO Airmen tackle the lethality phase of the course, conducting premarksmanship instruction followed by range qualification for individual and crew-served weapons. Army rifle marksmanship is always a new experience for Airmen,

The combat patrol live-fire exercise allows Air Force leaders to plan a combat mission while Airmen test their ability to engage enemy targets in open and urban terrain.

who routinely qualify on paper targets at only 25 meters, while Army ranges feature "pop-up" target silhouettes in lanes at distances of 50 to 300 meters. This tests the Airmen's ability to scan, acquire, and engage multiple targets at true distances, using the full effective range of their weapons for perhaps the first time in their careers. The Air Force CST includes familiarization and qualification with the M249 squad automatic weapon and M240B machine gun, as well as an introduction to the M2 .50-caliber machine gun and the MK-19 grenade launcher. JSTO Airmen also conduct familiarization fire on the Army's short-range marksmanship course, testing their ability to fight their individual weapons systems effectively against enemy forces within 25 meters. The lethality phase concludes with classroom instruction on the most common threat weapons systems, including the AK-series automatic rifle and rocket-propelled grenades.

Air force personnel all appreciate the critical part that weapons training played in their deployment preparation.

"Weapons familiarization has paid off because we are armed whenever we travel. Many times Air Force personnel are lacking in weapons training and the Army team built great confidence in this area. The Air Force is changing its approach, and our basic training has been extended to place more emphasis on it."

The *shoot, move, communicate,* and *save lives* fundamentals all come into play in the final phase of the CST program, known as the combat patrol live-fire exercise. After two full days of practical exercises, rehearsals, and battle drills, the class is broken into groups of 20 to 25 personnel, occupying four to five HMMWVs. They are given a tactical mission requiring a patrol movement from one FOB to another. The live-fire exercise allows Air Force leaders to plan a combat mission while Airmen test their ability to engage enemy targets in open and urban terrain while mounted and moving. During the exercise, combat patrols encounter mock IEDs, react to ambushes, hastily recover damaged vehicles, and treat and then evacuate (simulated) casualties.

The CST course wraps up with an after-action review, followed by a course graduation and departure ceremony. At this ceremony, the Deputy Commanding General of Fort Carson reminds Airmen what is at stake during their upcoming deployment. *"The environment is dangerous and the enemy is constantly adapting,"* he is known to say, "*so every one of you has to be situationally aware and prepared to use the training you have had here at Fort Carson to save not only your own life but the lives of your team*." His words are a fitting send-off for these joint warriors, who are headed into harm's way.

Lieutenant Colonel McClellan served with 2-91st TSB for eight months as the brigade executive officer before assuming command of the 1-361st Engineer Battalion (Training Support) in June 2004. Previous assignments include platoon leader, company commander, and battalion S-3. He has served combat tours in Operations Desert Shield, Desert Storm, and Iraqi Freedom and has had overseas experience in Europe, the Balkans, Korea, and Central America.

("One Team," continued from page 13)

platoon was astounding, as demonstrated by its flexibility, speed, and seemingly effortless execution of the mission.

Summary

Soldiers from 4th Platoon demonstrated that engineer Reserve units are well-trained and well-led; the ability to effectively conduct troop-leading procedures contributed to its success. The platoon would continue to capture terrorists and fight alongside of tanks, Bradleys, and infantrymen with Alpha Company. Sometimes, Reserve units do not have the same level of equipment as an Active Army unit, so cross-leveling of equipment is recommended.

When it came to the Soldiers of 4th Platoon interacting with other Soldiers in the company, there was never any question on their competence. It used to be the perception of some people in the military that USAR and Army National Guard forces were just a cut below the Active Army forces. The men of 4th Platoon destroyed that stereotype. Friendships were instantly formed between platoons with 3d Platoon, Charlie Company, 458th Engineer Battalion, calling themselves "fourth platoon" before anyone in the company identified them as such.

Once demobilized, the Soldiers of 3d Platoon, Charlie Company, 458th Engineer Battalion, went back to their premobilization lives. But the assistance of the Soldiers of 4th Platoon allowed Alpha Company to accomplish its mission with might and honor.

Captain Edmonds served as commander of Alpha Company, 91st Engineer Battalion.

Captain Stone served as executive officer of Alpha Company, 91st Engineer Battalion.

First Lieutenant Restrepo served as the leader of 1st Platoon, Alpha Company, 91st Engineer Battalion.

First Lieutenant Heaton served as the leader of 2d Platoon, Alpha Company, 91st Engineer Battalion.

Attention Units!

Many post offices will not deliver mail without a street address. Please contact us to update your mailing address if the one we are using for you does not include a street address. Include the old address and your telephone number, as well as the corrected address, and e-mail to <*engineer@wood.army.mil*>.

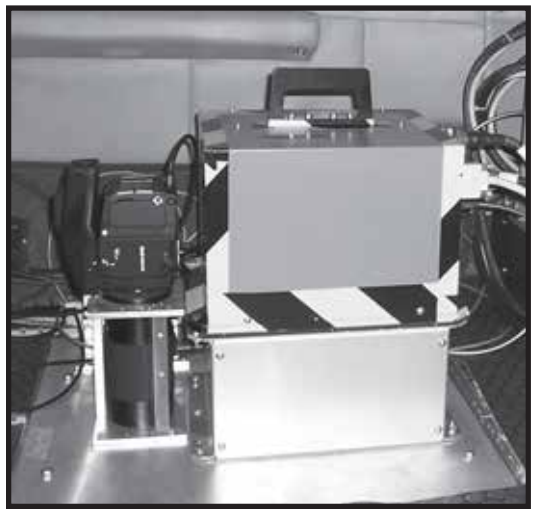
BuckEye Continues to Spiral to New Heights

By Ms. Karen Roberts

Born out of the need for a field-expedient change detection system to aid in spotting improvised explosive devices (IEDs), the BuckEye system has rapidly evolved from the initial prototype—based on electro-optical (EO) sensing—to a system using both high-resolution EO and light detection and ranging (LIDAR) imagery to produce highly detailed and accurate elevation data for better visualizing the battlefield.

BuckEye is a rapidly fielded, spiral development program of the United States Army Corps of Engineers®, Engineer Research and Development Center-Topographic Engineering Center (ERDC-TEC). BuckEye provides Soldiers with high-quality battlefield information through high-resolution imagery; geospatial intelligence; elevation data; intelligence, surveillance, and reconnaissance (ISR); and detailed maps of the urban area of interest.

The BuckEye system is fully functional. Platform independent, the aerial system operates on a variety of vehicles. The latest application of the BuckEye system is flying with the newly integrated LIDAR sensor, which creates high-resolution digital elevation models. Currently, the images are quickly compressed, georeferenced, and tied together to form a mosaic. During post processing, the submeter resolution color images can be correlated to the LIDAR data to create exceptionally accurate, high-resolution three-dimensional maps of cities. These high-resolution maps can be used to help Soldiers visualize threats on the battlefield, conduct



Sensor Suite

(Continued on page 46)

Urban Tactical Planner Image

Templating an Adaptive Threat

Spatial Forecasting in Operations Enduring Freedom and Iraqi Freedom

By Lieutenant Colonel Stephen R. Riese

Our adaptive adversaries in Afghanistan and Iraq continually challenge our ability to forecast future enemy activity and develop tactical plans. To meet these challenges, commanders and staffs need new tools that take advantage of the vast amount of information available to our troops.

The past decade has seen geographic information systems (GIS) move into the mainstream of tactical analysis. GIS are powerful tools that enable Soldiers in the field to collect, store, and analyze spatial information. Spatial information—where things are in relation to other things—has been a critical part of military planning as long as there has been war. And since almost every aspect of military operations has a spatial component, the range of potential GIS applications is almost endless.

One activity that GIS are particularly well-suited to help with is spatial-pattern recognition. Because GIS can make thousands or millions of distance calculations in minutes, analysts can now uncover and exploit patterns that might otherwise remain hidden. As seen in Figure 1, spatial patterns are present in many types of human behavior regardless of the scale. The unaided human eye can detect these patterns and groupings, but it usually requires the power of computers to help the analyst turn those patterns into tactically useful information.

Threat Mapper

In May 2004, the Army asked the United States Army Training and Doctrine Command (TRADOC) Analysis Center (TRAC) to assess the potential that spatial analysis provides in forecasting the locations of future mortar attacks. The initial results were quite promising, and TRAC—in collaboration with the Engineer Research and Development Center–Topographic Engineering Center (ERDC-TEC)—began the development of *Threat Mapper*, a computer program to help analysts in the field make spatial forecasts in support of tactical intelligence operations.

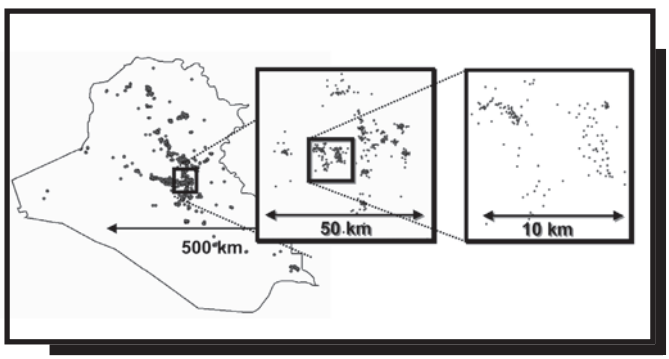


Figure 1. Patterns at various scales

Threat Mapper is designed for use at the tactical level, although it can be used at any echelon. Soldiers can use Threat Mapper to help with a variety of spatial forecasting and identification problems such as mortar attacks, weapons caches, and safe houses. Threat Mapper uses advanced pattern analysis techniques to measure the spatial similarity between an area of interest and an observed behavior. The results of that measurement are presented to the analyst in a threat map, which helps the staff build a more informed intelligence estimate and better plan intelligence, surveillance, and reconnaissance (ISR) and tactical operations (see Figure 2). Threat Mapper helps analysts recognize and adapt to changes in adversary behavior, even when that adversary is actively trying to appear random.

Threat Mapper currently functions as an add-in tool for ArcGIS, a commercially available GIS. ERDC–TEC's future plans for Threat Mapper include a Web-enabled version, as well as integrating spatial-forecasting methods into current and planned Army geospatial programs.

Tactical Forecasting

To illustrate how Threat Mapper can be used in the field, we built a simple threat map for an area that has had numerous mortar attacks. Figure 3 shows forward operating bases, roads, rivers, and the attacks that occurred in the area. These mortar attacks are the behavior of interest, meaning that the threat map will help us identify other locations probable for such attacks.

We first selected the features on which to measure spatial similarity. In reality, there is an almost endless list of spatial features, such as roads, buildings, and forests. In most cases, knowing which spatial feature to use is the most important and challenging task facing the analyst. Threat Mapper has several tools to help Soldiers determine the best set of features, but—as usual—experience, knowledge, and hard work are the best ingredients to build a successful intelligence product. Using the Threat Mapper tools, and a little trial-and-error, we will find a set of useful features.

Figure 2. Threat Mapper application from enemy behavior to threat map to tactical plan

Figure 3. History of mortar attacks

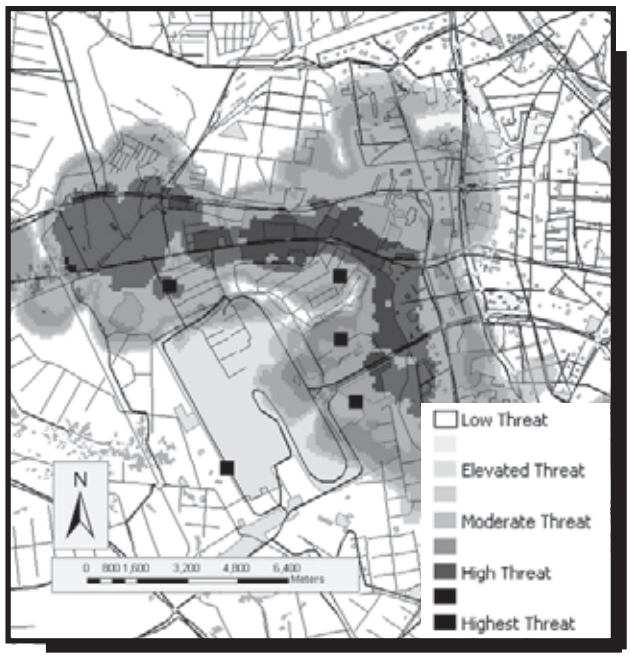


Figure 4. Example threat map with scale

One way to help measure the threat map's accuracy, is to see how well the map forecasts future behavior. In real life, new attacks would tell us if the threat map is a good forecaster or not. Here, we will use the recent historical attacks to play the analytic role of new attacks. To do this, Threat Mapper splits the data, using the early attacks to build or train the threat map and the recent attacks to check or test the accuracy of the threat map. After providing Threat Mapper more details about the data and requirements for the desired map output, the analyst hits the "go" button and lets the GIS go to work. The result is the printed map in Figure 1.

The Road Ahead

The Threat Mapper tool is currently developed as a deployable package in beta form. It has been tested in a variety of situations by the military, academia, and government. Recently, a team led by the ERDC Cold Regions Research and Engineering Laboratory (CRREL) trained Army geospatial and intelligence analysts on a suite of deployable tools, including Threat Mapper. The analysts' training with these tools will provide valuable feedback to Threat Mapper developers at ERDC–TEC and CRREL.

Conclusion

A word of caution: There is a great deal of uncertainty about when and where the next attack, of any kind, will occur. Threat Mapper can help analysts in the field build a more informed intelligence estimate, but no tool can yet predict exactly when and where the next attack will be. Also, Threat Mapper will not replace Soldier analysts in the field. What Threat Mapper will do is provide analysts in the field with a powerful spatial-forecasting tool to help them better analyze threat activity and thereby gain an information edge against the adaptive enemy.

Lieutenant Colonel Riese is a combat engineer and operations research analyst with the United States Strategic Command at Offutt Air Force Base, Nebraska. He has worked with maps and spatial analysis in one form or another for most of his life.

Mapmakers Scope Out Iraqi Terrain

By Sergeant Mitchell J. Armbruster

Soldiers with a terrain analysis detachment in Iraq provide maps and terrain analysis to the corps support command (COSCOM) and its subordinate units to help them accomplish their missions. The detachment, part of an active duty brigade, is on its first deployment with a COSCOM. The detachment was chosen after working with the COSCOM on two field exercises.

The detachment works near the COSCOM headquarters, making maps or creating overlays that give information on soil type, vegetation, and hydrology that are in a specific area. Soldiers can use this information to understand the types of roads, rivers, or canals they might be dealing with, as well as the depth or slope of the terrain. There are tactical applications for this knowledge, but it can also help coalition forces give the Iraqi people vital information to help them stimulate their economy.

Terrain analysts work on customer projects

The detachment can determine where vehicles can travel by soil type; they have a scale that ranges from *go*, *slow-go*, to *no-go*. By making these determinations, the terrain analysts can give units the vital information they need to make a mission successful.

The detachment makes hard copy maps or transfers the maps digitally to other parts of the COSCOM when needed. Their business is dictated by customer requests, and they have been extremely busy. Many units, after seeing the maps and products, have put in requests for their own maps.

Any map can be adapted to the needs of a unit. Most of the time, the team will use a map that is already made and add specific items to it. If items on the map—such as boundaries, buildings, or roads—have changed drastically, the map is reproduced. Terrain analysis is an ever-changing job because maps must be updated constantly.

Many things are involved with terrain analysis, such as cover and concealment and drop zones, that help U.S. forces secure victory with topographic analysis. The analysts in the detachment know that the work they do helps units and all Soldiers be successful.

Sergeant Armbruster is a public affairs specialist for the 207th Mobile Public Affairs Detachment, Fort Collins, Colorado. He holds a bachelor's in filmmaking and is working on a second degree.

Environmental Awareness Is for the Birds... and Everyone Else!

By Dr. JoAnne Castagna

A flock of young shorebirds spread their wings and fly away from their nests on East Inlet Island in the Long Island Intracoastal Waterway in New York for their first major flight south for the winter. A few years ago, this wouldn't have occurred because many of these birds are threatened and endangered. It's a reality now because people from several agencies put their minds together and created a project that not only benefits wildlife but their team players as well.

In 2002, the United States Army Corps of Engineers®, New York District—in cooperation with several environmental, state, and local agencies—created a wildlife habitat on this island for threatened and endangered bird species, using dredged sand from the waterway. Sand is regularly dredged to ease boat travel.

Photo by U.S. Fish and Wildlife Service–Long Island Field Office

East Inlet Island

This sand was placed on the mainland in the past, but Long Island's growing residential and business developments have limited land space. So the team of agencies had to think of another location, and they decided on an environmentally beneficial one.

For the past few years, shorebirds—such as least terns, common terns, piping plovers, and roseate terns—have colonized, nested, and bred on this island, demonstrating an example of how the Corps is collaborating with partnering agencies to produce successful environmental projects.

In the past, the dredging projects have been criticized by the public for affecting endangered shorebird habitats. Once the Corps proposed creating a bird habitat with the dredged sand, it received enthusiastic support. Some of the most vocal critics turned around and actually supported the innovative things the Corps was doing.

Performing environmentally friendly projects is hard at first but—in the end—is beneficial to all involved. The following are benefits that can be expected:

- *Strengthens customer relationships*. When customers, such as environmental agencies, see the positive results of environmentally aware projects, it increases their trust. As a result, these customers—who may have been originally wary—may be more open to providing ideas for improving the project.

- *Builds public trust*. When the public realizes that their quality of life has been enhanced in ways above and beyond the ones originally envisioned for the project, their trust and support of the project increases.

- *Saves time and money*. Performing an environmentally aware project is hard at first, but it gets easier. In the beginning, you may find yourself educating and convincing an organization of the benefits of the project. Trust must be built with environmental groups and agencies so they have confidence in what is being done. Once a project becomes a success story, the efficiency increases because it is easier for you to do the project. For example, it is less difficult to secure permits from the local people, and support for the project increases, which saves time and money.

- *Expands engineer skills*. You will experience a wider breadth of professional experience in the environmental field and gain personal satisfaction that you are doing good things, smart things.

- *Produces better projects*. A successful project receives increased customer support, allowing it to be produced more efficiently. Customers who are happy with the project will be open to providing ideas and suggestions for improvement and will work to remove potential project barriers, such as securing permits, saving the project time and money.

To be more environmentally aware, do the following:

- *Talk and listen*. Talk with the local people and resource agencies to get to know them, and listen to find out what they value and what their issues are. Put your head together with individuals who have ideas on how to make the project more environmentally friendly. This not only brings fresh ideas into the mix but also improves relationships with these individuals and groups.

- *Research*. Check out the Web sites of the major agencies or groups that you plan to work with, which will provide you their mission and priorities and might give you ideas.

Being environmentally friendly in projects requires innovation and creative thinking. As with any innovative or creative endeavor, it helps to have input from several different viewpoints. You cannot do this without including people who do not see the world as you do. The management of the group dynamics is the hard part—gaining individual trust and making the diverse group productive.

Dr. Castagna is a technical writer/editor for the United States Army Corps of Engineers, New York District. She can be reached at <joanne.castagna@usace.army.mil>.

("BuckEye," continued from page 41)

BuckEye With LIDAR

mission planning, augment target folders, check on project status for the Corps's reconstruction projects, and gain a better understanding of the urban terrain.

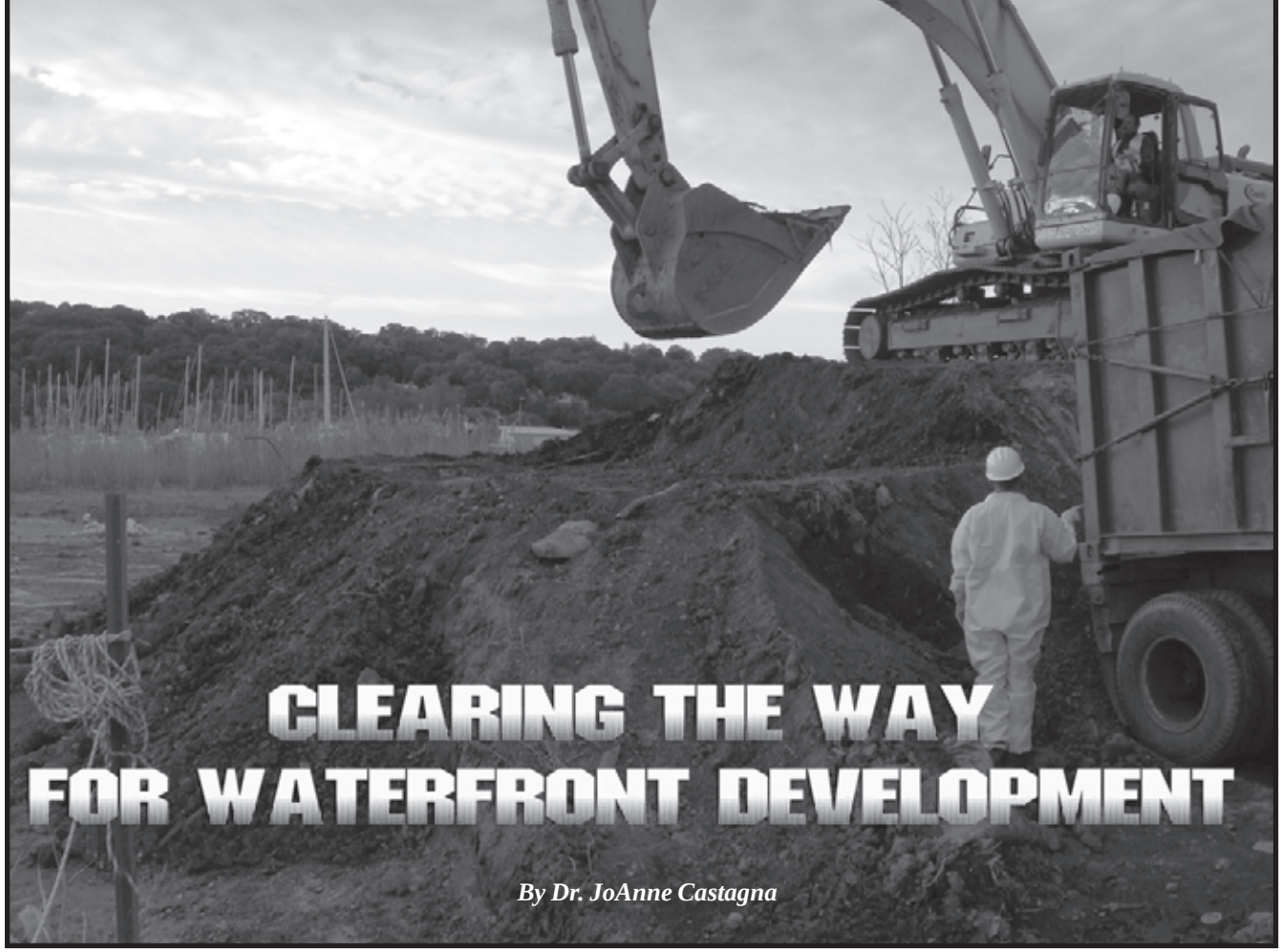
BuckEye can be used to help increase security by capturing imagery throughout designated areas. This imagery gives the terrain a realistic look as to where features are in relation to the known landmarks. To a terrain analyst, BuckEye provides immense benefits with its imagery platform.

Army commanders are recognizing the benefits of having high-quality geospatial intelligence prior to executing their missions. The commander of the 1/25th Stryker Brigade Combat Team (SBCT) reported on one of these benefits. He said that Mosul is a teeming city of two million, making it easy for insurgents to hide and build vehicle-borne improvised explosive devices (VBIEDs) and IEDs out of sight. But the SBCT has the highest percentage of found VBIEDs and IEDs in Iraq, because it uses its assets to see first, before just running in, which was the way of the past.

Similarly, BuckEye is used to improve the Soldiers' situational awareness by providing them with highly accurate imagery that can be used to produce current, high-resolution reference graphics and image maps. It provides accurate and high-resolution geospatial information for terrain analysis, operating environment visualization, and change detection to assist the warfighter in achieving dominance of the battlefield.

BuckEye information is already being incorporated into the Urban Tactical Planner. According to the BuckEye program manager, the goal is to see the BuckEye system fielded with every Army terrain team to ensure that Soldiers have the edge they need to win the war.

Ms. Roberts is a public affairs specialist with the Engineer Research and Development Center–Topographic Engineering Center. She has been providing public affairs support to the Army for the past five years. She holds a bachelor's in social science and a master's in public affairs.



CLEARING THE WAY FOR WATERFRONT DEVELOPMENT

By Dr. JoAnne Castagna

Recently, on a cool, breezy morning on the Glen Cove waterfront in New York, the city's mayor stated to the public and media that as she stood before them, the last truckload of radioactive waste was being hauled from that property, clearing the way for a new waterfront development. Standing beside her were members of the United States Environmental Protection Agency (EPA); United States Army Corps of Engineers®, New York District; and state and local agencies that played major roles in making this milestone a reality for the small community.

Li Tungsten Superfund Site

The Li Tungsten Superfund Site is comprised of the former Li Tungsten facility; the Captain's Cove property, which was used as a disposal site for some of the facility's waste; and the Glen Cove Creek, which was contaminated with slag from the facility operations. For decades, the 1-mile industrialized portion of the Glen Cove waterfront was occupied by various industries, and a portion was used as a dumping ground. All of this occurred before the establishment of the strict environmental laws we have today.

Wah Chang Corporation and Wah Chang Smelting and Refining Company were two of these companies. Ironically, Wah Chang means "great development" (in part) in Chinese, and these companies—along with others such as the Li Tungsten Corporation—ran facilities on different portions of the site from the 1940s to the mid-1980s.

These facilities processed tungsten, a material used in industry to harden steel. The tungsten ores were received from around the world and smelted to produce items such as tungsten carbide powder, tungsten wire, and welding rods. The heavy metals and radioactive ore residues from this production process contaminated the property.

In the mid-1980s, the Li Tungsten Corporation—the last in a series of site operators—went bankrupt, and the property was purchased by the Glen Cove Development Corporation.

New York State asked the EPA Region 2 to investigate the property's land and nine buildings and to remove any contaminated waste left by the company.

Photo by Mark Pane, EPA

An aerial view of the Li Tungsten Captain's Cove Site

The EPA found large quantities of hazardous materials, such as laboratory chemicals and polychlorinated biphenyl (PCB)-contaminated waste, in hundreds of rusted drums and in above- and belowground tanks. In addition, they discovered asbestos, transformers, and gas cylinders containing compressed liquids and gases, as well as elemental mercury spills on the property. An EPA contractor had the site remediated, and the most serious chemical and radioactive hazards were removed.

The EPA investigation also found low-level radiation and heavy metal contamination—posing a public health risk—in the soil throughout the 26-acre Li Tungsten facility, as well as in the nearby 23-acre Captain's Cove property that had been used as a dumping ground by area businesses and residents.

Corps Assists EPA

In the spring of 2005, the EPA issued an Interagency Agreement with the Corps's New York District to perform remediation work at the Captain's Cove portion of the Li Tungsten Superfund Site. The work was performed by the Corps's Kansas City District, which was responsible for excavating the soil, separating the radioactive and metal-contaminated soil from the noncontaminated soil, and transporting the contaminated soil to appropriately licensed disposal facilities.

Approximately 87,500 tons of radioactive soil and 35,000 tons of metal-contaminated soil have been removed from the site and transported to disposal facilities. This cleanup, along with the future cleanup of other areas of the site, must be completed to allow for the development of the waterfront. Throughout the construction period, the public has been protected from any potential health threats by monitoring the air quality and inspecting and cleaning trucks that enter and leave the property.

Waterfront Development

The Li Tungsten Superfund Site properties are the centerpiece for the community's plans to revitalize 214 acres of the city's waterfront. Glen Cove Industrial Development Agency's goal is to link the city's nearby downtown shopping area with the waterfront. Thirty percent of the development will be comprised of parks, public squares, nature walks, and botanical gardens. Pedestrian-friendly walking paths will be lined with restaurants, art galleries, stores, and hotels. In addition, there will be luxury condominiums and various modes of public transportation (trolleys, electric carts, water taxis, and ferry service) to New York City.

The waterfront development is expected to create as many as 1,700 new full-time jobs and bring in new business that will generate an estimated $200 million in annual sales. The Glen Cove waterfront development is expected to be completed in a decade.

To learn more about the waterfront development, visit <*www.glencove-li.com*> or for information about Superfund, visit the EPA Web site at <*www.epa.gov/superfund*>.

Dr. JoAnne Castagna is a technical writer/editor with the United States Army Corps of Engineers, New York District. She can be reached at <joanne.castagna@usace.army.mil>.

Environmental Compliance Officers in Iraq

By Major Kenneth D. Kozak

Environmental compliance officers (ECOs) in Iraq face big challenges. They deal with issues such as hazardous waste; radioactive lightning arrestors; petroleum, oil, and lubricant (POL) spills and contaminated soils; and hazardous waste pickups. In addition, ECOs oversee hazardous material and waste storage, wastewater/sewage facilities, burn-pit/trash operations, and fuel storage. They conduct environmental assessments, environmental baseline surveys, cultural and archeological resource protection programs (there are more than 8,000 of these sites in theater), endangered-species management, and environmental site closure of bases. Environmental training is the key to enabling ECOs to appropriately manage these issues.

After serving as a civil/structural engineer for the past five years with the 99th Regional Readiness Command, I was assigned to Iraq to oversee the country's ECO program. To garner command emphasis for ECO appointments and training, I prepared an ECO fragmentary order (FRAGO) for staffing with the Multinational Corps-Iraq (MNC-I). The FRAGO (Training for Major Subordinate Command [MSC] and Base Camp Environmental Compliance Officers) was approved and made part of the MNC-I operation order (OPORD). The purpose of this FRAGO was to identify and train an ECO at the MSC level and at least one ECO on each forward operating base/ base camp in theater.

Wanting to ensure that all appointed ECOs received the appropriate training, I contacted the Directorate of Environmental Integration (DEI), United States Army Engineer School, at Fort Leonard Wood, Missouri, and requested assistance in making training available to all the ECOs stationed in Iraq.

One training option is for MNC-I C-7 (engineer section) Environmental to deliver classroom training to ECOs in theater that need certification or recertification. With the support of the information management section, Soldiers also have the option of accessing the ECO course on the MNC-I C-7 Environmental Web site or through Army Knowledge Online (AKO). The third training option is a compact disk (CD) developed by DEI that contains the ECO course and test. MNC-I C-7 would provide each MSC several of these CDs, and the respective MSC ECO would be responsible for distributing the course, tracking the test results, and submitting the results to MNC-I C-7 on the provided ECO spreadsheet.

Soldiers must receive a minimum score of 70 percent on the test to become ECO-qualified. The MNC-I C-7 will submit all

Constructing an incinerator

A new sewage treatment plant

passing scores and names to the Army Training Support Center, at Fort Eustis, Virginia, for credit.

I am also working to provide support through an information network for ECOs. A previous FRAGO (Hazardous Materials and Hazardous Waste Procedures) to MNC-I OPORD requires that all bases appoint an ECO. Each MSC should have a list of ECOs for the forward operating bases/base camps. If there is not a current list, Task No. 5 of a recent FRAGO reinforces the order to comply by stating that not only will all ECOs be identified and trained, but a chain of command to address environmental concerns, problems, and any questions will be established. The ECOs have reachback capability to MNC-I C-7 if an environmental issue does occur or questions arise.

It is a challenge for the ECO Soldiers stationed in Iraq, who use the Overseas Environmental Baseline Guidance Document (OEBGD), the United States Army Forces Central Command (ARCENT), and MNC-I C-7 Environmental standing operating procedures as the standard for environmental issues. Currently, there are no environmental guidelines set by the government of Iraq. But with training and an information network, the ECOs are providing a better environment to sustain the mission and secure the future for our Soldiers and the Iraqi people.

Major Kozak, a reserve engineer officer, is the environmental officer assigned to the MNC-I C-7 office in Iraq. He holds a bachelor's in civil engineering from Penn State.

The 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 welcome.

Include photos (with captions) and/or line diagrams that illustrate information in the article. Please do not include illustrations or photos in the text; instead, send each of them as a separate file. Do not embed photos in PowerPoint. If illustrations are in PowerPoint, avoid 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.

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

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Send submissions by e-mail to <*engineer@wood.army.mil*> or send a 3 1/2-inch disk in Microsoft Word, along with a double-spaced copy of the manuscript, to: Editor, *Engineer Professional Bulletin*, 320 MANSCEN Loop, Suite 348, Fort Leonard Wood, Missouri 65473-8929.

Note: Please indicate if your manuscript is being considered for publication elsewhere. Due to the limited space per issue, we usually do not print articles that have been accepted for publication by other Army professional bulletins.

Constructing the First TUAV Landing Zone on Fort Bragg

By Captain Stephen C. Amato

The 618th Engineer Company (Light Equipment) (Airborne) completed the first dedicated tactical unmanned aerial vehicle (TUAV) landing zone on Fort Bragg in early August 2005. The project has long been needed to provide training space for the TUAV aircraft. Named "Ram Landing Zone," it was constructed with the installation support of the Land Rehabilitation and Maintenance (LRAM) section of Integrated Training Area Management (ITAM)—an element of the Directorate of Plans, Training, and Mobilization. The 618th completed the landing zone, which covered just less than 5 acres, in approximately 5 weeks—a quick turnaround for a multiagency project.

Selecting a Site

The 82d Airborne Division's pinnacle event each training quarter is the joint forcible-entry exercise (JFEX) that includes United States Air Force aircraft dropping personnel and equipment and possible support from A-10s or other attack aircraft. This brigade combat team (BCT)-level event includes airborne operations followed by air-land support into a drop zone's landing zone to build combat power for the exercise. The 313th Military Intelligence Battalion's TUAV platoons participate in the JFEX, but they needed their own training space. The airspace coordination required that the TUAV flight path be a given distance away from the Fort Bragg training area boundary and situated where it would have little effect on Army aviation airspace or artillery restricted operations zones to fire through when the TUAV was launched or landed.

Once range control decided to allow the construction of the landing zone at Ram Drop Zone, the next task was to fit the landing zone within the area around the endangered wildlife and plants, marshes, and perimeter tree line and in line with the prevailing wind. The TUAV specifications also require a clear area at the ends of the landing zone.

Design Criteria

The requirements for a TUAV launch-and-recovery site are more stringent than most of the specifications for expeditionary aircraft (for example, the C-130 Hercules) primarily because of the nature of the Shadow 200 TUAV. But even though the landing zone would be built as a launch-and-recovery site, it is described as a landing zone because it can still be used to land small aircraft, if required.

Project Design

Construction of the landing zone began soon after the project was approved by the division as a good concept and worth applying funding toward. The initial courses of action consisted of three possibilities:

Drainage swale and check-dams provide drainage for the landing zone.

- An aggregate subgrade on geotextile with a clay cap.
- An aggregate subgrade on geotextile with a stabilized clay cap.
- An aggregate subgrade on geotextile with a concrete cap.

The primary problem with all of these courses of action was cost, and after much consideration, the third one was deemed the only affordable solution. During the discussions over funding sources for the site, a new idea emerged. ITAM personnel asked if it would be feasible for the 618th Engineer Company to clear and grub, then grade and level, the site. A contractor would be hired to stabilize the in-place surface of the landing zone, using ITAM tillers and the 618th's Caterpillar® CS-433C Type III "Z-lite" steel drum vibratory rollers. The LRAM section would assist with runway stabilization and erosion control measurements—further reducing the cost—and would coordinate with the North Carolina Department of Environment and Natural Resources of Fayetteville and Raleigh for compliance with state regulations and policies. Lastly, ITAM would fund hydro-seeding of the area around the landing zone to provide soil stabilization.

ITAM contacted Midwest Industrial Supply, Inc., Canton, Ohio (because of the company's ability to stabilize soil using custom-made emulsions), and a Midwest chemist visited the site and took soil samples in order to prepare an admixture for the landing zone. The material used would consist of polyvinyl acetate acrylic polymer emulsion known as Soil Sement®. When this customized mixture is added to the native soil, the material provides a dense, compacted surface. The benefits of such a runway are that it requires little maintenance for long periods of time, eliminates the need for dust control, and can be used during inclement weather. Many Midwest products have been approved by the Engineer Research and Development Center (ERDC) and are in the General Services Administration catalog. These include dust suppressants, additives for improved asphalt road longevity, and a high-mobility multipurpose wheeled vehicle (HMMWV) dust control water distributor.

Project Timeline

Clearing and grubbing the site required several days. This operation, which was fairly straightforward, involved removing all the organic material from the site. The initial topographical survey completed by the company's surveyors revealed the site to be generally flat, but it still required a considerable amount of cut-and-fill operations to build the needed drainage and slope for the landing zone. The grading and leveling of the landing zone required the company to manage the poor water percolation on-site with drainage swales and check-dams to prevent soil erosion on and off the project site.

Once the 618th brought the site to the proper grade, it compacted the surface in preparation for the stabilization phase. ITAM used its offset disk tillers and scarified the landing zone surface, and Midwest followed the tillers with its applicator truck—applying roughly 18,000 gallons of Soil Sement to the surface of the soon-to-be landing zone. The 618th then graded the tilled soil to a level grade and followed up with Caterpillar CS-433C rollers (without using the vibrator) for compaction. The stabilized landing zone was allowed to "cure" for 24 hours before Midwest sprayed a final surface application of 1,500 gallons of Soil Sement, which sealed the surface and provided additional strength.

Grading, leveling, and drainage construction operations using the 613BS Scraper and DEUCE

Training With the Landing Zone

The first training exercise at Ram Landing Zone was during the August 2005 JFEX. The TUAVs were integrated into the ground tactical plan of the JFEX without affecting the air coordination of numerous airborne drops of personnel and equipment that same week.

The 313th Military Intelligence Battalion is proposing additional facilities adjacent to the landing zone, which will improve the overall value of the site. These include a covered TUAV maintenance area, an improved vehicle parking area, and a power/telephone drop.

The landing zone project was a resounding success. It served as a realistic training event for the Soldiers of the 618th Engineer Company, facilitated realistic TUAV training, and improved TUAV training locations on Fort Bragg.

Reference

Midwest Industrial Supply, Inc.; Canton, Ohio, 800-321-0699, < *www.midwestind.com*>.

Captain Amato is the commander of the 618th Engineer Company (Light Equipment) (Airborne). Previous assignments include S-4 for the 307th Engineer Battalion during Operation Iraqi Freedom; brigade engineer for the 505th Parachute Infantry Regiment; and plans and exercises officer for the 2d Infantry Division Engineer Brigade. He holds a bachelor's in civil engineering from the Illinois Institute of Technology and a master's in engineering management from the University of Missouri-Rolla.

ENGINEER UPDATE

Commercial numbers are (573) 563-xxxx and Defense System Network (DSN) numbers are 676-xxxx unless otherwise noted.

Urban Mobility Breaching Course (UMBC). The UMBC is a 3-week course conducted at Camp Lejeune, North Carolina, by the United States Marine Corps, with assistance from three United States Army engineers. Two weeks of the course are consolidated training, and the remaining week is Army-unique. The maximum Army course load for the UMBC is 15 students. Slots for the course can be reserved through the Army Training Requirements and Resources System (ATRRS).

The UMBC provides advanced information on urban breaching operations. The course consists of in-depth explosive theory; detailed planning that combines operational and training safety issues; urban reconnaissance; and employment of urban breaching assets, including explosive, manual, and ballistic breaching techniques for urban operations. The UMBC teaches the use of Current Force equipment that supports mobility operations in support of the maneuver force.

Students must meet requirements listed in Department of the Army Pamphlet 611-21, *Military Occupational Classification and Structure,* and Army Regulation 600-9, *The Army Weight Control Program;* be a combat engineer noncommissioned officer in the grade of E-5 (P) through E-7 and a graduate of the combat engineer Basic Noncommissioned Officer Course (BNCOC); have no pending Uniform Code of Military Justice (UCMJ) actions; and have no limiting profiles.

Fiscal Year 2006 Class Schedule

Class Number	Report Date	Graduation Date
01-05	16 Oct 05	4 Nov 05
02-05	27 Nov 05	16 Dec 05
03-05	22 Jan 06	10 Feb 06
04-05	26 Feb 06	17 Mar 06
05-05	4 Jun 06	23 Jun 06
06-05	13 Aug 06	1 Sep 06
07-05	10 Sep 06	29 Sep 06

The point of contact for this course is the Directorate of Training and Leader Development (DOTLD) Sergeant Major at (573) 563-4094 or e-mail <*atsedot@wood.army.mil*>. *The* DOTLD Web site is <*http://www.wood.army.mil/dotld/*>.

Center for Engineer Lessons Learned (CELL). The United States Army Engineer School CELL needs your help. To keep training, doctrine, and combat developments current and to prepare for the future, it is critical that the school continuously receive relevant engineer observations, insights, and lessons (OIL). The CELL can derive information from a variety of sources: unit after-action reports (AARs); tactics, techniques, and procedures (TTP) used by units in and returning from theater; Soldier observations/submissions to the Engineer School; and requests-for-information (RFIs).

This information is used to conduct doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) gap analyses and to determine solutions. These solutions are distributed to the Engineer Regiment via new doctrine and training products, *Engineer* (The Professional Bulletin of Army Engineers), and other publications, Web sites, and by answering RFIs. (The Engineer School RFI Web site provides the Engineer Regiment a reachback capability.)

You can help by forwarding any of these materials from your unit's deployment to the CELL. Unclassified information can be sent to <*Doctrine.Engineer@wood.army.mil*> or <*reggie.snodgrass@us.army.mil*>. Classified information can be sent by secret Internet protocol, routed (SIPR) e-mail to <*snodgrassrg@monroe.army.smil.mil*>. For more information, call (573) 563-4117.

Visual Archive. The History Office at the Engineer School is developing a visual archive. It currently has more than 18,000 photographs, largely from World War II and Korea. Units that would like to contribute photographs (copies) or other visual material should contact Dr. Larry Roberts, Historian, United States Army Engineer School, Fort Leonard Wood, Missouri 65473. Where possible, caption information should accompany the images. If you have questions, call Dr. Roberts at (573) 563-6109.

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