ENGINEER

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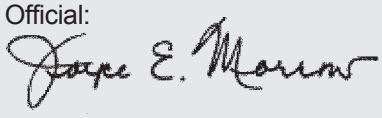

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Front Cover: Soldiers of HHC, 130th Engineer Brigade, conduct precombat checks before departing LSA Anaconda, Iraq, in support of a humanitarian mission. (See article on page 41.) Photo by Staff Sergeant James Morris.

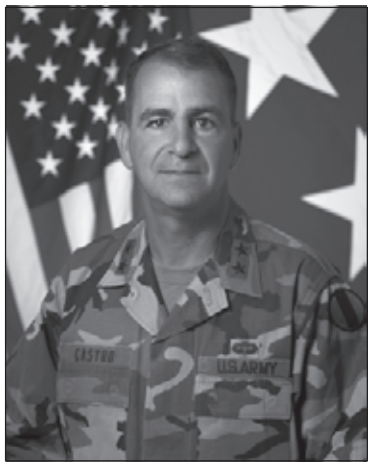
Back Cover: Photos courtesy of the United States Army.

DEPARTMENTS

FEATURES

Clear The Way

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



Hello everyone and greetings once again from Fort Leonard Wood. Judy and I are thankful for the fantastic time we had with the Soldiers, families, and communities here at the home of the Engineer Regiment. We often talk about Soldiers needing to be agile and adaptive, and soon we will get a chance to see a great agile and adaptive leader in action. Major General William (Bill) McCoy and his wife Jill will be returning to Fort Leonard Wood to take command and lead our Regiment into the future once he completes his mission as Commander of the Gulf Region Division in Iraq.

I would like to thank Brigadier General Todd Semonite and his wife Connie for their inspirational leadership as the Assistant Commandant of the United States Army Engineer School (USAES) for the past year and Command Sergeant Major Clinton (Clint) Pearson and his wife Mollie for tremendous support to our Regiment as well. In July, we welcomed Brigadier General Jack Sterling and his wife Cathy as our new Assistant Commandant. Jack is one of our premier Warfighters who will support our Nation at war and shape our Regiment for the future.

I am extremely proud and honored to have served our Regiment and our Soldiers as your Commandant. I am very impressed with the accomplishments of our sappers, civilians, families, and communities during the past two years as we supported the Global War on Terrorism. I thank each one of you and your families for your sacrifices. The past two years have brought huge positive impacts on our Regiment in support of our Army's missions. Our "Engineer Team" has blended the powerful capabilities of all three components of our Regiment to provide a very responsive capability and function for our Nation. We are all connected in our Team of Teams.

Just to highlight a few of the key successes over the past two years: We have modified every engineer organization that supports the Army to ensure that we can properly support expeditionary warfighting. We have developed improved capabilities inside the Brigade Combat Team (BCT) and are in the process of standing up and converting new Combat Effects Battalions and Construction Effects Battalions to meet the assured mobility function of our ground maneuver commanders.

Clearly, our Counter Explosive Hazards Center (CEHC) remains our Regiment's and Army's "Center of Excellence" for countering explosive hazards. The CEHC has trained both Army and Marine units in improvised explosive device (IED)-defeat awareness and route reconnaissance and clearance and continues to integrate the latest lessons learned from the United States Army Central Command AOR and combat training centers into our unit and institutional training courses.

There have been significant improvements in developing and acquiring new combat vehicles designed to defeat IEDs on the battlefield. Examples of these key pieces of equipment are the Buffalo, the RG-31, the Assault Breaching Vehicle (ABV), the Joint Assault Bridge (JAB), and robot vehicles, all designed to prevent injuries and save lives. And the Program Objective Memorandum (POM) to modernize our equipment has increased more than $5 billion.

We have redesigned both the Officer Basic and Advanced Courses, as well as the Noncommissioned Officer Advanced Course to better develop the "pentathletes" required by our Army now and in the future. Our courses now include key tasks of IED-defeat battle staff planning and considerations for units preparing for combat.

I'm extremely proud of the significant accomplishments from our units in the field in Iraq, Afghanistan, and locations around the world; our Regiment is making a very positive difference, from the Gulf Region Division and Afghanistan Engineer District to the combat units—Active Army, United States Army Reserve, and Army National Guard—to our civilians serving in harm's way to defeat terrorism and help rebuild peaceful nations.

In closing, I say again how thankful I am to have had the opportunity to serve the Regiment alongside such great Soldiers, leaders, and community families as our Regiment trains, deploys, transforms, and restations to meet the needs or our Nation at war. Judy and I wish you all the best. Let's continue to improve our Regimental Team of Teams!

Essayons…and Carry On!

Lead The Way

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

Welcome to another great issue of *Engineer*. This quarter has been absolutely *amazing* as we engaged in events ranging from changing major leaders to standing up new units. I offer my sincerest gratitude and a fond farewell to Brigadier General Todd Semonite and his wife Connie, Major General Randal Castro and his wife Judy, and Command Sergeant Major Bill McDaniel and his wife Samm, for they will be truly missed. While these farewells are tough, they become a little easier knowing great people aren't that far behind. Among those to whom I wish a warm welcome are the new Assistant Commandant Brigadier General Jack Sterling and his wife Cathy; the new MANSCEN Command Sergeant Major Michael Hayes and his family; and Major General William McCoy, who will return to Fort Leonard Wood in October as the MANSCEN Commander and Engineer School Commandant, and his wife Jill.

We continue to work the three Ts (Transform the Regiment, Train Soldiers and Leaders, and Take Care of the Regiment) here at the Engineer School. As we transform the Regiment and the Army, we are consolidating MOSs and training them for success. This will help us fight the fight and win the Global War on Terrorism (GWOT). The Fusion Cell continues to gather and present data on the current state of engineer transformation, restationing, and support for the GWOT as they assist in issue identification, communication facilitation, and issue resolution. Synchronization among global repositioning and the BRAC initiatives; deployment in support of GWOT; and transformation to the modular Regiment is the key to success to the Regiment.

To date, the Regiment has activated two engineer battalions from scratch; one brigade, two battalions, one geospatial planning cell, and three equipment support companies have converted to the new modular engineer design.Within the next year, four engineer battalions will be activated and one brigade, two battalions, and a geospatial planning cell will convert.

The Regiment continues to ensure that our noncommissioned officers (NCOs) are getting the best institutional training in the Basic Noncommissioned Officer Course (BNCOC) and the Advanced Noncommissioned Officer Course (ANCOC). These courses will provide the technical training to support and win the GWOT and provide the right training for the Future Engineer Force. Our vision statement boldly guides the Noncommissioned Officer Education System (NCOES) transformation process: *An Engineer Noncommissioned Officer Education System grounded in heritage, values, and tradition; embodies the Warrior Ethos and values; and perpetuates learning to develop NCOs empowered to lead, train, motivate, and retain Soldiers.*

We have recently developed a new course map for the 21B/21C BNCOC and ANCOC based on the critical task selection panel that convened this fiscal year. Many participants were an integral part of the process, to include representatives from the Army National Guard and United States Army Reserve. We have conducted course reviews for our 21H, 21N, 21T, and 62B MOSs in preparation for critical task selection boards and course redesigns.

Positive enhancements continue here at the Engineer School. The migration of updated doctrine and functional courses from the Counter Explosive Hazards Center is an ongoing process. Our BNCOC is leading the way among regiments, introducing search training and forward operating base training during situational training exercises and migrating skill level 3 tasks from the Urban Mobility Breaching Course. In ANCOC, graduates are now certified as train the trainers on the Improvised Explosive Device Defeat – Train the Trainer (IEDD-T3) Course; training on infrastructure requirements—sewer, water, electricity, academics, and trash (SWEAT)—is being conducted; and linking with the EOD fusion cell is extremely valuable. Our NCOES continues to be on the leading edge of digital training. Soldiers attending BNCOC receive 40 hours of FBCB2 training, and ANCOC students receive a 40-hour certification on MCS 6.4 along with 16 hours of MCS-Engineer training. The future of the Engineer Regiment looks brighter than ever as the Army looks to define and implement the pentathlete concept; our outstanding engineer NCOs have always lived and trained that concept before it was even defined.

In closing, I am *very* pleased with the way engineers continue to maintain high standards and lead the way during this GWOT. I am so very proud to be serving in this Regiment. I ask each of you to remember the Soldiers who are away from their homes and families. May God bless our fallen comrades and keep watch over our sons and daughters as we continue to fight the fight. Essayons!

130TH ENGINEER BRIGADE: A YEAR IN IRAQ

By Colonel Thomas W. Kula

Simply put, it's about attitude. The 130th Engineer Brigade and other Operation Iraqi Freedom (OIF) 05-07 engineers went into the country determined to continue the success of previous engineer units and to make a difference. The following articles (pages 4-43) highlight this determination and accomplishments in numerous areas of engineer support to the Multinational Corps–Iraq (MNC–I). It was a team effort all year long. I would like to thank all the OIF 05-07 engineer brigade commanders for their unwavering support and commitment to the fight, the MNC–I command and staff for their guidance and support, and especially the OIF 04-06 team. You set us up for success.

Our Challenge

In October 2005, the 130th conducted relief in place (RIP)/transfer of authority (TOA) of the corps engineer brigade for the MNC–I with the 20th Engineer Brigade. The OIF 05-07 rotation was a turning point for engineers: Their force structure was reduced by 25 percent because the two engineer brigades serving under the 20th, the 30th, and the 194th Engineer Brigades were not replaced. By early December 2005, the 130th was the only engineer brigade above division level in the MNC–I. The unit looked at this period "right out of the starting blocks" as one of its defining moments as the corps brigade. The 130th commanded all corps engineer units spread across the entire theater, including the United States Air Force facility and utility detachments. Truly a joint engineer force, the brigade's strength averaged about 3,300 Soldiers, Sailors, and Airmen—either assigned, attached, or under tactical control (TACON) or administrative control (ADCON)—during its year in-theater.

Building the Team

The 130th team was not only joint but also a mix of active and reserve—one determined "total" Army engineer force. The 130th was augmented with the 412th Engineer Command Construction Management Section (CMS) upon arrival in Kuwait to fill the missing part of the modified table of organization and equipment (MTOE). The 412th's tasks were numerous, not only filling the traditional role of a CMS but also serving as the command and control element for the many facility engineer teams and detachments attached or TACON to the brigade. The 412th CMS was ready and trained, and its accomplishments as part of the OIF 05-07 engineer team are a story in itself. As we built the team, the 46th, 54th, 84th, and 110th Engineer Battalions were also significant in helping piece the engineer team puzzle together with each of their missions.

The 130th built its team and staff well before deployment, ready to link the separate pieces together once in-theater. Beginning with the first of seven corps training exercises, started in September 2004, the command and staff prepared a list of the keys to successful staff operations (Figure 1). Preparation began a year out from deployment, while the brigade simultaneously deployed two of its assigned units from Germany—the 94th Engineer Battalion (Combat) (Heavy) and the 502d Engineer Company—to OIF 3. The 130th staff had its "head in the fight" by deploying and training its units, focused on the complex operating environment in Iraq. We participated in seven command post exercises (CPXs) at the corps and brigade levels to prepare for our mission.

Before the V Corps mission rehearsal exercise (MRX), brigade leaders conducted three leader's recons in-theater so that we fully understood and exercised our mission during this critical MRX. By the time the 130th arrived in Kuwait for reception, staging, onward movement, and integration (RSOI), all that remained was polishing individual and collective battle tasks before heading north into Iraq to assume its mission.

A second product developed during these exercises was a wallet-size leader card to disseminate the command philosophy (Figures 2 and 3). These basics and fundamentals built the

Basics of Brigade Operations

- Execute the fundamentals
  - By staff (expert in your lane)
  - By information (what to do with it)
  - By key roles and missions of the top 5
    - Brigade commander (BC)
    - Command sergeant major (CSM)
    - Deputy brigade commander (DBC)
    - Chief of staff (CoS)
    - S-3
- Keep everyone engaged
  - Clearly identified duties
  - Clearly identified responsibilities
- Maximize use of technology: How can we do it quicker and more efficiently?
- Promote teamwork among staff sections, higher and lower
- Plan ahead: Resource subordinate units for success

Figure 1

Prep for the Fight

Mission, Vision, and Priorities

MISSION: On order, the 130th Engineer Brigade deploys and conducts engineering operations in support of V Corps and regional combatant commanders in a joint environment.

VISION: All units and Soldiers in the 130th Engineer Brigade are prepared for combat. The brigade has trained and disciplined Soldiers (that live the Warrior Ethos), adaptive leaders, and competent staffs.

PRIORITIES:

- **Leader Development:**
  - Empower leaders and hold them accountable.
  - Conduct performance and developmental counseling.
  - Train subordinates to do their job and the job one level up.
- **Training:** Prepare for combat by focusing on the basics and mission-essential tasks.
- **Maintenance and Logistics:**
  - Assign ownership and maintain and account for equipment.
  - Execute systems to standard to sustain operations.
- **Readiness:** Readiness is the sum of personnel readiness, family readiness, superior training, and disciplined maintenance and logistics programs.
- **Caring:** Take care of our Soldiers and their families.
  - Process quality, timely administrative actions and awards.
  - Enforce high standards in barracks, work areas, and facilities.
  - Encourage effective family readiness groups.

SAFETY is part of caring. Risk management must be part of our daily regimen. Our goal is no loss of life. Leaders make a difference!

Dec 04

Figure 2

Command Philosophy

Be a Leader.

- Define the standard.
- Lead by example.
- Lead from the front.
- Hold Soldiers accountable.
- Recognize excellent performance.

Be a Soldier.

- Be disciplined. Always do what's right.
- Be proud to be in the Army and in the 130th.
- Be sharp, motivated, and professional.
- Be mission-oriented. Live the Warrior Ethos and Army values.
- Be a team-player.
- Be safe on duty and off duty. Conduct risk management for all that we do.
- Be innovative, creative, and show initiative. Don't wait to be told what to do.
- Be positive. Always maintain a positive, can-do attitude.
- Be balanced. Maintain a balance between your job, professional development, personal hobbies, spiritual growth, physical fitness, and social activities. Have fun and spend time with your family and friends.

* Teamwork and positive attitude

* Fight through challenges

Dec 04

Figure 3

OIF 05-07

Commander's Intent

PURPOSE: Provide proactive joint expeditionary engineer support that is essential, timely, and relevant.

- Proactive: Anticipate requirements and marshal resources before they are needed.
- Essential: Focus on the main effort and provide support according to the commander's priorities.
- Timely: Be on time and to standard to meet operational timetables.
- Relevant: Achieve minimum military requirements doing what others cannot do for themselves.

KEY TASKS:

- Maintain and upgrade lines of communications. Purpose: Ensure uninterrupted ground movement throughout the area of operations.
- Support the MNC–I Coalition Basing Plan. Purpose: Expand enduring bases and support the scheme of maneuver.
- Support development of ISF and construction of Ministry of Defense (MOD)/Ministry of Interior (MOI) bases. Purpose: Support the transition of the operational environment to Iraqi control.
- Reinforce tactical reconstruction efforts. Purpose: Support divisional and MNC–I nonlethal effects.

END STATE:

- Achieve assured mobility of MNC–I units along corps main supply routes.
- Perform expedient military repairs to infrastructure replaced by permanent repairs or reconstitution by MNF–I or civil agencies.
- Consolidate coalition bases according to United States Central Command (USCENTCOM) Sandbook standards and the MNC–I campaign plan.
- Implement effective command and control to ensure responsive and sustained engineer support.

Figure 4

OIF 05-07

Standing Sapper Rules

- Make security and safety the first priority.
- Enforce discipline and standards: every Soldier, every day, no complacency—do the right thing even when no one is watching.
- Always maintain situational awareness and aggressively execute battle drills.
- In everything we do, look at how we can involve the Iraqis and help them win. Treat the Iraqi people with dignity, and respect their customs and cultures.
- Do not depart on a mission unless you are 100 percent ready, have all situational updates, have coordinated your movements, and have completed the risk management process.
- Know and enforce the rules of engagement (ROE).
- Fight through challenges, and never run out of options.
- Take care of your equipment. Perform preventive maintenance checks and services (PMCS), precombat checks (PCCs), and precombat inspections (PCIs) to standard!
- Use your battle buddy. Take care of yourself and each other. Stay balanced.
- Remember your solemn responsibility to protect the American way of life. Love your Soldiers, accomplish your mission at the least cost, and be a Warrior.

Figure 5

foundation for preparing the staff to assume corps engineer brigade command and control. These principles for staff, leaders, and Soldiers are just as important today as they were at the start of the deployment. They were also useful tools to pass along to our successor.

As the 130th coordinated with the team prior to deployment, we shared our philosophy for combat operations with our subordinate units. Figures 4 and 5 show OIF 05-07 cards sent out to units before deployment. The130th leadership used the same cards to brief battalion and company leaders as they flowed through RSOI in Kuwait. There are never enough opportunities to team-build for OIF, and these products were useful.

The 130th continued to emphasize *security*, *safety/risk management*, and *discipline* throughout deployment. We considered these as three legs of a stool, with *leadership* banding together and reinforcing the legs. On the stool rests *mission accomplishment* and *keeping troops alive*. It's a platform for success, with each part vital.

Missions and Achievements

With the mission as the MNC–I corps engineer brigade, the 130th's primary focuses were assured mobility (route clearance and bridging) and theater construction. As a carryover from the 20th Engineer Brigade, the 130th continued to provide proactive, essential, timely, and relevant engineer support to the MNC–I. A few of the many missions and achievements of the 130th Engineer Brigade units in OIF 05-07 were—

- *Route clearance* – achieved and consistently sustained greater than 50 percent of the improvised explosive devices (IEDs) found on corps routes.
- *Route sanitation* – cleared 700 kilometers of debris and trash along main routes.
- *IED blasthole and pothole repair* – filled more than 600 potholes.
- *Construction and facilities design and management* – completed 345 projects across theater.
- *Bridging* – emplaced three assault float bridges (AFBs) and one medium Mabey-Johnson bridge (MJB) (Float), conducted two long-term rafting operations, and maintained eight bridges.
- *Topographic/geospatial engineering* – completed 1,800 surveying and mapping projects for units in-theater.
- *Well drilling* – provided wells in Multinational Force–West (MNF–W) at forward operating bases (FOBs) and Iraqi security force (ISF) camps to reduce logistics haul requirements.
- *Electrical power repair, generation, and distribution* – provided constant power to 25 contingency operating bases (COBs) and FOBs and reduced safety hazards.
- *COB and FOB infrastructure repair and expansion* – improved power, water, and sewer systems to Amber or Green ratings.
- *ISF development* – constructed ISF contingency outposts and checkpoints and partnered with the Iraqi Engineer School.
- *Support reconstruction efforts* – supported force protection projects of Iraqi infrastructure.

Joint Team Effort

The success of the brigade was a joint team effort across all the Armed services. From the Air Force detachments working construction all over Iraq, to the Navy electronic warfare officers on brigade and battalion staffs, to embedded Navy explosive ordnance disposal (EOD) personnel, to the mix of Active Army, United States Army Reserve, and Army National Guard service members, the 130th Engineer Brigade was a multifaceted force that made a difference in-theater. Each member of the team played an important role and, by the end, helped the 130th leave its mark during OIF 05-07.

Conclusion

The 130th Engineer Brigade units completed OIF 05-07 with pride and a true sense that they had made a difference. It was a long year; we fought through challenges, and some of our Soldiers were wounded and killed while trying to make a difference. We will never forget our fallen comrades.

Even though the war continues, we measure our success by the victories of our units. We gave it our all, and our sense of accomplishment is best summed up by Coach Vince Lombardi:

"I firmly believe that any man's finest hour, the greatest fulfillment of all that he holds dear, is the moment when he has worked his heart out in a good cause and lies exhausted on the field of battle—victorious."

OIF 05-07 corps engineer units—Soldiers, Sailors, and Airmen—you made a difference. Thank you for serving your country!

Colonel Kula is the commander of the 130th Engineer Brigade. Previous assignments include Joint Readiness Training Center senior engineer observer-controller; Chief, Plans, 82d Airborne Division; Commander, 307th Engineer Battalion, 82d Airborne Division; and plans/operations officer at the United States Southern Command. He is a graduate of the United States Military Academy and the United States Army War College Fellowship Program at the University of Texas.

The accomplishments of Operation Iraqi Freedom 05-07, in support of the Multinational Corps–Iraq, that are described in the articles on pages 4 to 43, were not achieved without loss. Our stories are dedicated to the memory of the Soldiers who gave their lives to help us make a difference.

Corporal Andy D. Anderson	46th Engineer Battalion	Fort Rucker, Alabama
Sergeant Carlos Eugene Pernell	46th Engineer Battalion	Fort Rucker, Alabama
Sergeant Michael David Rowe	46th Engineer Battalion	Fort Polk, Louisiana
Staff Sergeant Omar D. Flores	54th Engineer Battalion	Bamberg, Germany
Sergeant Alkaila Tonee Floyd	54th Engineer Battalion	Bamberg, Germany
Specialist Felipe Jose Garcia Villareal	54th Engineer Battalion	Bamberg, Germany
Specialist Troy Carlin Linden	54th Engineer Battalion	Bamberg, Germany
Specialist Joseph Paul Micks	54th Engineer Battalion	Bamberg, Germany
Private First Class Joseph I. Love	84th Engineer Battalion	Schofield Barracks, Hawaii
Staff Sergeant Lewis J. Gentry	94th Engineer Battalion	Vilseck, Germany
Private First Class Alva L. Gaylord	110th Engineer Battalion	Lexington, Missouri
Specialist Michael Layne Hermanson	164th Engineer Battalion	Minot, North Dakota
Sergeant Leroy Segura, Jr.	362d Engineer Company (MRB)	Fort Benning, Georgia
Sergeant Dustin Daniel Laird	913th Engineer Company (CSE)	Union City, Tennessee
Sergeant Luis Ricardo Reyes	947th Engineer Company (CSE)	Colorado Springs, Colorado

COMMAND RELATIONSHIPS IN A COMBINED FORCE

By Major Matthew V. Burton

As the world is well aware, fighting the war in Iraq is a joint fight: U. S. military forces come together to conduct joint operations. Communication between the administrative control (ADCON) and operational control (OPCON) units is critical. Engineer leaders must doctrinally understand their ADCON and OPCON role because operations in a joint environment will only increase in the future.

Responsibilities

When it comes to understanding command and control relationships, such as ADCON and OPCON, it is critical for battalion- and brigade-level leaders and staff planners to know their roles and responsibilities. Leaders and staff officers must understand the boundaries and limitations to avoid interference with maneuver or combat missions or administrative roles and responsibilities. Likewise, subordinate units must know what to expect and where to go for administrative and logistical support. Not understanding the command relationship or having unclear lanes of responsibility and an ambiguous relationship can be detrimental to an effective and smooth combat operation.

In a joint or multinational force environment, the number of combat commanders with OPCON of engineer forces assigned to the engineer brigade is increasing on the battlefield. ADCON encompasses administrative (legal, personnel, and finance) and logistical support to the maneuver forces. When designated as an ADCON unit, the engineer brigade enters into agreements for certain responsibilities.

Authority

ADCON is the control vested (primarily) in the engineer brigade chain of command and the exercise of authority over subordinate engineer units in respect to administration and support. It includes the organization of engineer forces, control of resources and equipment, personnel management and administration, unit logistics, training, readiness, deployment, redeployment, discipline, and other matters not included in the operational missions of the subordinate or other organizations.

To accomplish missions, commanders are often provided different levels of authority. The amount of authority depends not only on their current position in the chain of command but also on the type of mission. Additionally, when forces are assigned or attached resulting from a relief in place (RIP)/transfer of authority (TOA), the gaining commander assumes a different authority. It is also important for planners to understand the chain of command, the authorities and responsibilities that exist within the chain of command, the various relationships among the ADCON and OPCON commanders during the military decision-making process, and how vital it is to successfully plan any mission with an ADCON or OPCON command relationship.

Chain of Command

The chain of command is the succession of commanding officers, from a superior to a subordinate, through which command is exercised. It is a single chain of command with *two* distinct command relationships. One branch—administrative—extends from the ADCON commander (engineer brigade) to the engineer battalion commander; the other branch—operational (where missions are carried out)—extends from the OPCON commander to the engineer battalion commander.

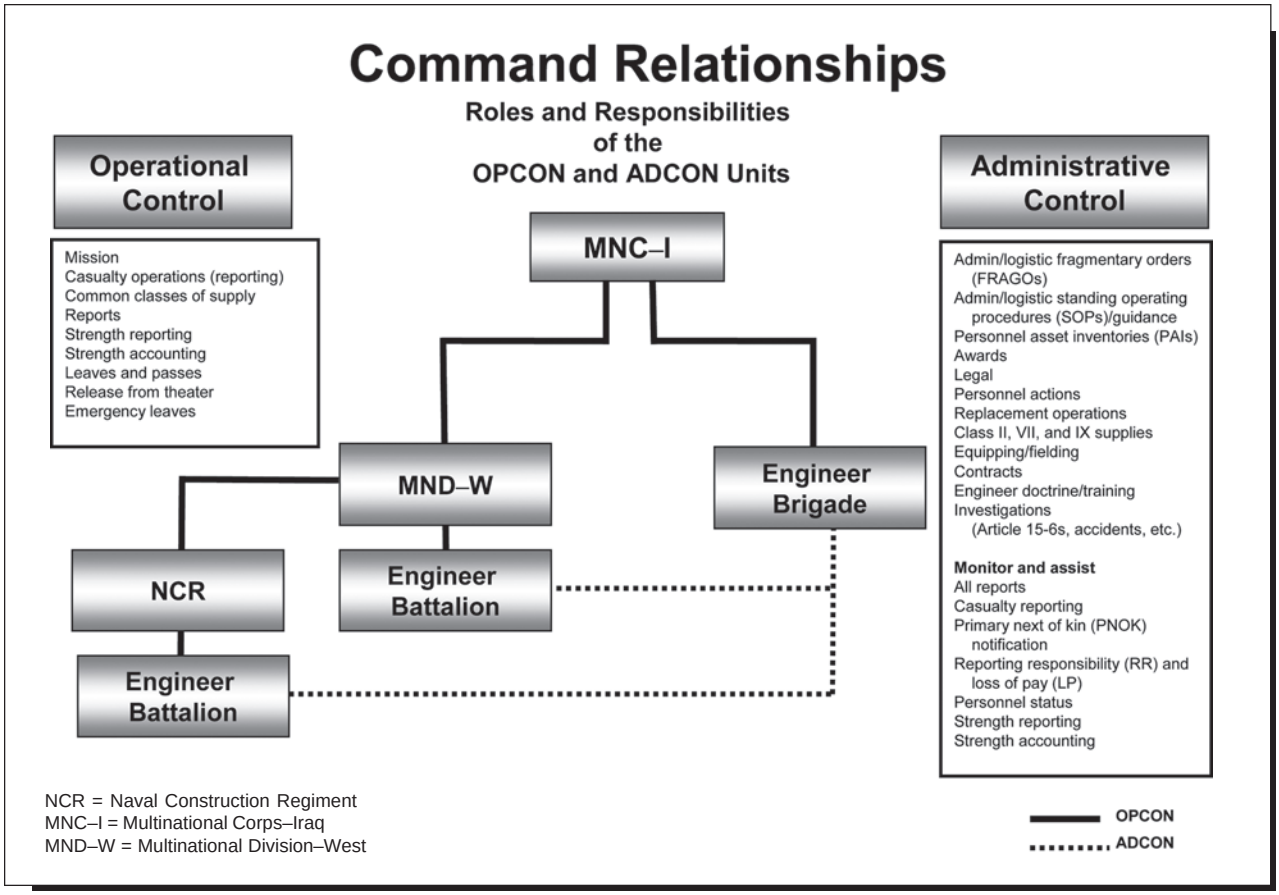
OPCON

Inherent in command authority, OPCON is the authority to perform the functions of command over subordinate forces that involve organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. OPCON does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training.

The employment of engineer forces to attain an operational objective through the organization, integration, and conduct of major operations requires services to work with one another. This requires the joint force commander to task-organize Army engineers to work with the Marines for tactical operations, integrating key forces at the level necessary to accomplish assigned missions. Anything that would affect the OPCON, maneuver, or unit combat operational readiness would go through the OPCON unit.

Considerations for the OPCON unit (maneuver) are as follows:

- Tracking emergency leave.
- Tracking rest and recuperation leave and passes.
- Submitting strength reports.



- Maintaining strength accountability.
- Reporting casualties (using the Defense Casualty Information Processing System [DCIPS]).

ADCON

Administration and support includes organization, control of resources and equipment, personnel management, unit logistics, individual and unit training, readiness, discipline, and other matters not included in operational missions of subordinate or other organizations. ADCON gives authority over subordinate or other organizations on administration and support.

Considerations for the ADCON unit (engineer brigade) are as follows:

- Making recommendations to the OPCON commander on the proper employment of engineer forces.
- Conducting specific engineer-oriented training.
- Informing the OPCON chain of command of changes in logistics and administrative support and logistics functions normal to the command.
- Providing supporting operation and exercise plans with necessary engineer data to support missions assigned by the OPCON commander.
- Enforcing internal administration and discipline: evaluations, Uniform Code of Military Justice (UCMJ) actions, safety reporting, logistical reporting, and casualty operations (casualty notification and assistance).

One way of avoiding conflict or crossing the ADCON or OPCON lane is to have or develop something similar to a memorandum of understanding and agreement that spells out everything from safety and accident investigations, to evaluations, to Class II and Class IX supplies.

Conclusion

Establishing the roles and responsibilities of the ADCON and OPCON units creates a better combat working environment between the units and gives subordinate units a better understanding of when, where, and how to report, as well as what actions to take to be successful on the battlefield. For more information on command relationships, see Joint Publication (JP) 0-2, *Unified Action Armed Forces*.

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Photo by Captain Scott Updike

Joint Engineer Culture Clash

Lessons Learned From a Marine Expeditionary Force

By Major R. Daren Payne and Lieutenant Colonel Carol L. Anderson

The 46th Engineer Battalion (Combat) (under the administrative control of the 130th Engineer Brigade) recently served in one of the most unique command structures and diverse task organizations an engineer unit has encountered—joint and multicomponent—representing almost every facet of our nation's military. During this time, the Soldiers and leaders of the 46th learned many hard, valuable lessons and had many "outside the box" construction and combat engineering experiences. Such diverse units and organizational structures, with joint and multicomponent characteristics, are likely to be the rule rather than the exception in the future. This article shares some of the lessons learned and experiences from the unit's year in-theater.

In October 2005, the 46th deployed to Multinational Force–West (MNF–W) in support of Operation Iraqi Freedom. The MNF–W area of operations was under the command of a Marine expeditionary force (MEF), rather than an Army division or corps headquarters, so all Army units fell under a Marine Corps general officer. Since the 46th is combat heavy, the MEF further assigned the unit to the 30th Naval Construction Regiment (NCR)—an Active Navy headquarters commanded and staffed by United States Navy Reserve and a few Active Navy officers. The regiment changed several times during its deployment and sometimes included naval mobile construction battalions (NMCBs) (commonly known as *Seabees*), Marine Corps engineer support battalions, and Army combat engineer battalions.

Soldiers, Sailors, and Marines engaged in the full spectrum of construction, combat engineering, and assured mobility missions—which included wood frame construction, route repair, bridge repair, route clearance, security escort patrols, direct support to maneuver units in kinetic operations, and most important of all, support to Iraqi military and security forces. There was clearly a lot of learning, synergy, and cultural sensitivity that took place to keep the engineer missions moving forward on a daily basis. The 46th learned a great deal during its deployment to share with fellow engineer units.

Language Barrier

When venturing to a new place, the first thing Soldiers need to learn is how to speak the local dialect—something a person traveling to a different area in the United States might also need to do. Similarly, fellow military professionals are often separated by a common language. Marines are part of the naval service and the naval traditions. Therefore, even in the middle of the desert, nautical references abound. This became apparent during the construction of an Iraqi security forces (ISF) base camp. The mission to build infrastructure for ISF troops was a joint operation with Alpha Company, 46th Engineer Battalion, attached to NMCB 22, a Reserve Component unit from the 30th NCR. Adapting to nautical dialect was a challenge. Shower and latrine trailers are "ablution units," a kitchen is a "galley," a "scullery" is a dish-washing facility, and living areas are "berthing spaces." Left and right are "port and starboard" and a wall is a "bulkhead." "Hooah" is "oorah" and "roger" becomes "aye–aye." Of course, this was reversed when Bravo Company—charged with erecting Southwest Asia (SWA) huts with climate control, central power grid, and force protection—was reinforced with a platoon from NMCB 40, an Active Navy

unit from the 9th NCR. This time Sailors learned a "head" was a "latrine" and "cover" was "head gear." As a result, our Soldiers and Sailors not only learned new acronyms and nomenclatures but also how to immerse themselves in a different culture and succeed—a lesson that will help in many other situations where adapting to new things and new ideas is paramount to success.

Organizational Identity Crisis

As Army engineers, our organization identity is one of "fight-and-build" units, while all Marines take pride in the credo "every man a rifleman." The Navy sees things a bit differently. The NMCBs are organized as construction and construction management organizations. Both Active and Reserve Army Soldiers and Active and Reserve Marines within the NCR spend the majority of their training time honing combat skills (physical training, live-fire exercises, demolitions, and mine training), but less time on practicing core competencies (vertical and horizontal construction). Navy engineers, on the other hand, obtain "graduate level" skills (military occupational specialty for the Army). Among both the Active Navy and the Reserve Component of the naval engineer community, all personnel E-6 and above must have a professional license or certification. There are many licensed electricians, plumbers, master carpenters, and steel workers or welders. Every officer must earn a professional engineer certification and maintain a current license.

This gap in knowledge, skills, and craftsmanship between Army and Navy engineers is too big to ignore. So don't ignore it; use it to your advantage! The major reason for this gap is that Navy units are *construction organizations,* as opposed to Army or Marine engineer units that are *combat units*. The NCRs and NMCBs are more organizationally akin to the United States Army Corps of Engineers® (USACE) than they are to the Army's deployable engineer battalions and brigades or groups. There are two positives to this. First, it offers a unique opportunity for both combat and combat heavy engineers to learn while working with a Seabee unit. Many of our young carpenters, electricians, plumbers, and combat engineers will find that Seabees are more than willing to share their knowledge. Army officers can also learn a great deal from their Navy counterparts. Nowhere outside of USACE can a young officer learn more about planning, programming, and construction management than working with NMCB or NCR staff. Secondly, Seabees operating in a combat zone have a unique opportunity to learn about weapons employment, small-unit tactics, immediate action and reaction drills, vehicle identification, and many other tasks that will help them stay alive on the battlefield. Thus, there are many opportunities to share knowledge and help bridge the gap in organizational identity between the services.

Cultural and Institutional Differences

There are long-standing cultural and institutional differences between the Army, Navy, and Marine Corps team that Soldiers of all ranks need to consider in a

Photo by Captain Scott Updike

Seabees and Soldiers combine skills to erect formwork during a project.

Photo by Captain Scott Updike

A Seabee and a Soldier work side by side hanging trim on a SWA hut.

joint environment. The Navy rank structure is unique and the rights and privileges of each rank are very different. Marine rank structure is similar in insignia and nomenclature, but different roles and responsibilities are expected of each rank. Several examples are as follows:

- The Navy is more conscious about separating officers, chiefs (E-7 and above), and enlisted (E-6 and below). Each group has separate heads, berthing areas, recreation areas, and galleys, if possible. The Marines operate in a similar manner.
- The chief petty officer or gunnery sergeant (E-7 or above) is equivalent to a command sergeant major or first sergeant in the Army. If you need to make things happen, make one of these guys your first stop.
- A Marine corporal or sergeant (E-5) is expected to be a squad leader capable of leading patrols outside the wire. In the Army, such responsibility normally rests at the sergeant first class or lieutenant level. In the Navy, it is nothing to see a chief petty officer in charge of 50 personnel and 10 pieces of equipment on a $10 million high-visibility project. A chief is expected to be professionally licensed in at least one trade, have a degree, and know project management at a higher level than an Army captain or major.
- Saluting and uniformity is not emphasized. Sailors and Marines don't salute, and they have different uniform policies when not on duty. They work in hard hats and remove blouses or unblouse boots, while Soldiers work in helmets and full uniform. Also, Sailors and Marines don't have a standard physical training uniform.

These and many other differences exist between the services. Learning to work with these differences is a challenge that noncommissioned officers in particular must practice daily so Army standards and traditions are upheld, yet offenses to our hosts are avoided.

Additionally, there are many institutional differences that units should prepare for:

- The Navy is more meticulous on accounting and its Class IV supply and construction management; cost and schedule accountability procedures are more detailed. The Navy tracks projects by man-hours and uses the number of man-hours available or expended to determine how much work can be done. Physical training, meals, training, and maintenance do not count as man-hours expended toward a project according to the Navy. This created some problems in the beginning, because in the Army, it's part of our routine. In contrast, many Marine Corps systems are in some ways less time consuming than Army systems.
- Marine and Navy deployments are shorter than Army deployments. This led to some friction, especially when a new MEF or NCR arrived on its first deployment. Often this forced units task-organized to Navy organizations to reinvent standing operating procedures and tactics, techniques, and procedures every few months. Patience and cooperative attitudes by leaders go a long way toward establishing relationships that help accomplish the mission.
- Marines, like the Army, fight in small-unit teams that train, live, play, eat, and fight together as one functioning unit. Seabees are pooled into companies and pulled out and sent to detachments to complete a project under a chief or junior officer. When the project is over, the detachment separates.

Learning from Reserve Components

Many of the lessons learned from working with Reserve Component Seabees and a United States Army Reserve combat support equipment (CSE) company simply reinforced prior experiences with Reserve units. Among the new lessons learned, however, was that Reserve Soldiers and Seabees possess skills and abilities that

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Battle-Tracking Tips for Junior Leaders

By Captain Jackquline N. Waddell

Battle tracking is not limited to battle captains, engineers, or maneuver units; it is used for every position in every branch of the U.S. military. When dealing with the demands from any facet of battle tracking, one thing is certain: there is no surefire approach to accomplishing it 100 percent error-free. People are human, and humans make mistakes. In fact, if a command is demanding, the battle tracker will probably experience a few growing pains while trying to get a handle on it. Battle tracking is best learned through experience. And later, these lessons learned will prove to be invaluable.

During Operation Iraqi Freedom, the 130th Engineer Brigade provided an opportunity to work in a corps separate engineer brigade as a battle captain. Entering the Iraqi theater for the first time as a newly promoted captain is definitely a fly-by-the-seat-of-your-pants type of experience. One useful thought for junior captains or noncommissioned officers (NCOs) responsible for battle tracking is that some of the most valuable learning points come when things are going wrong.

By understanding the intent and concept and implementing six simple control measures, anyone can tailor a unit battle-tracking system that could drastically reduce the discomfort generated from the entire process.

Intent

The intent of battle tracking is to facilitate the higher and lower and left and right exchange of information. The intent is simple, but the execution can be quite difficult depending on your personality, skills, and ability to establish good working relations.

One solid example of an environment that requires extensive battle tracking is a tactical operations center (TOC). A TOC is considered a nerve center or hub for planning, executing, monitoring, and reporting the status of missions. A TOC or a modified form of a TOC exists at every level in the military. The goal of battle tracking in a TOC is to monitor the execution of all tasks so the information is analyzed properly, ensuring that the information reported to higher headquarters is timely and accurate.

Concept

The concept is one that is completely fluid and is mission-dependent. It is important to understand that the concept is only as effective as the person implementing it and requires tailoring for every position in a unit. It depends on a unit's specific mission and changes with every mission. If someone is not receptive to change, the battle-tracking process is difficult. Most people do not attend a course or field training exercise that prepares them for what is required from a unit with a high operating tempo that demands intense situational awareness.

Control Measures

The control measures can be categorized into six areas: proper personnel allocation, preparation and training, battle rhythm identification, situational awareness, accurate information reporting, and effective communication.

Proper Personnel Allocation

When a unit is told to deploy, it should not procrastinate. Leaders must backward plan, obtain critical dates, and allocate personnel appropriately. Leaders should evaluate deployment-related positions and assign Soldiers to those positions according to the skills and abilities they possess. If not, the deployment can be quite challenging.

It is not advised to assign Soldiers to slots just to fill them, because not everyone will perform battle tracking efficiently. If a Soldier easily understands concepts; pays attention to detail; and speaks in clear, concise sentences, this Soldier should be considered for employment in a TOC position.

Preparation and Training

If at all possible, assign demanding positions in advance and allow Soldiers assigned to the TOC to train, deploy, and redeploy in those assigned positions. Usually, Soldiers assigned to battle-tracking positions in a TOC are senior enlisted or junior officers and are employed as battle NCOs and captains. Those are also the same Soldiers who are made responsible for executing or monitoring the unit's pre-deployment preparations.

Do not allow the personnel assigned as future battle trackers to spend all of their training time monitoring container loading or duffle bag painting. These Soldiers need to train realistically and often. Do not allow training to be overlooked or make scenarios easy just to check the block and get them out of the way. The training needs to set a standard that conveys a worst-case scenario so all Soldiers get a good grasp of what may be encountered, how it should be handled, and what information analysis needs to be conducted.

Rafting and construction operations are just two of many possible missions a unit would track.

Once in-theater, a leader can't expect a Soldier to effectively track the battle or perform to standard if a clear standard was never established. Unless absolutely necessary, leave the Soldiers in their assigned positions for the entire training, deployment, and redeployment process. Ensure that every Soldier is cross-trained to seamlessly cover down in the event of any loss of personnel. Once the unit is engaged, the time required to train anyone hinders the entire battle-tracking effort.

Battle Rhythm Identification

Battle tracking is usually defined by a battle rhythm or a command schedule of events. There will always be implied or specified suspense dates for products or briefings. As soon as possible, identify the section's or unit's battle rhythm, the pertinent suspense times, and the information your section is required to compile. Institute a calendar showing every suspense date, and use it as a backward-planning tool. By doing this, it is easy to implement controls or systems, which in turn aids in the battle-tracking effort.

Systems and tracking devices have proved to be one of the most critical tools in battle tracking. Establishing solid guidelines is essential to ensure that operational missions (such as route clearance, construction, and casualty operations) or Soldier-related issues (such as Red Cross messages) are not missed. As a rule, anything that requires an action, a reply, or a report needs to be tracked.

There should be a system developed for every task required by your section, and all systems should be documented. This isn't something that has to be dramatic or complex: just something that outlines the basic procedures. Establish a tracker for every task required so the status can be briefed at any given time and kept updated and archived. Keeping archives may seem completely mundane, but—once in place—it becomes second nature. This will ensure that any question, even if it was an issue or concern from a previous month, can be easily referenced and answered. Every unit will lose personnel for one reason or another, and it is much easier to cross-train new personnel if tracking procedures are in place.

Situational Awareness

Ensure that Soldiers have situational awareness of everything going on, whether it directly affects them or not. Make a log, and use it for operational notes; have the Soldiers write as they go because they will need to refer back to their notes. Do not leave Soldiers in the dark by hoarding information. Sharing information with them encourages them to share information also.

Talk to superiors, Soldiers, and adjacent units, and establish sound points of contact. Take the time to know what missions are going on 360 degrees around your section. Do an informal "what's hot" session with your immediate personnel, and go over upcoming, current, and completed missions regularly. There will be times when Soldiers will be stopped and asked mission-related questions. The information they know or do not know is a direct reflection of their battle NCOs or captains.

Accurate Information Reporting

When a section is required to report something, make sure the information is accurate and on time. Information reporting

and battle tracking go hand in hand. If the information provided is inaccurate, the Soldiers look incompetent and—depending on the mission—Soldiers could get killed. An implied task is ensuring that every piece of information or report that leaves your section is right. If it is an electronically generated document, don't just hastily put it together; learn how to use the spell-check function effectively.

Effective Communication

Without effective communication, both verbal and written, battle tracking is useless. One of the primary goals is to make it easier to report information on the status of a unit's missions to higher headquarters. In any position, the battle NCO or captain has to be able to communicate the information effectively to Soldiers, superiors, the command, and other units. Every Soldier communicates, but not every Soldier communicates effectively. Understand that effective communication is achieved only when the information exchanged is relayed and understood by both parties. Without effective communication, the mission becomes confusing, and the intent is lost.

If you are unclear in your intent, or don't prepare and rehearse your brief, you won't be taken seriously, and the value behind your input is lost. Take the time to think about *what* to brief before briefing it. If you sound as if you don't know what you're talking about, then what you're trying to convey will be dismissed. If something isn't known, make sure it is stated as unknown, then take notes, find the answer, and report back. When speaking to any command, provide only the information that is relevant. The command usually wants to know up front the bottom line, and giving too much information loses their attention and your intent.

Summary

Battle tracking is not easily mastered, and there are often situations that Soldiers and leaders are not prepared for. Taking the initiative to identify and understand what is expected in battle tracking sets the unit—and the mission—up for success. Establish a plan for whatever positions there are, and afford Soldiers time to prepare and train in their assigned positions. Planning ahead will make the transition from garrison to deployment easier for all concerned. Communicating with personnel on current issues—as well as what is expected and when—and training them how to communicate effectively will have profound rewards. These common sense things will ensure that the unit and its Soldiers are seen as professionals and what they say will be taken seriously.

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("Culture Clash," continued from page 13)

far exceed their job descriptions due to civilian life experiences. An example is the vertical construction completed by a CSE company; they built SWA huts and completed other projects normally assigned to a general construction platoon. The Reserve Seabees also displayed a similar diversity of skills. Perhaps the biggest lesson learned was the different administrative systems.

Working in an environment with so many Reserve Soldiers and Sailors provided a great opportunity to appreciate the skills brought to the fight and to learn the logistics and administrative Reserve systems—knowledge that will benefit engineers as they deploy more often as multicomponent teams.

Conclusion

The 46th Engineer Battalion learned many lessons, improved its understanding of joint operations, honed many skills, and executed many missions. Alpha and Bravo Companies worked as task force engineers, providing close combat engineer support to kinetic operations conducted by maneuver task forces. Simultaneously, the CSE company built a bottled water plant for the Marine Logistics Group, while Sailors and Soldiers worked side by side establishing ISF strongpoints, outposts, and base camp facilities. No matter what the counterinsurgency fight demands, the 46th is now better prepared to support any campaign plan. Its experiences provide a road map for fellow units by demonstrating the language barriers, cultural and institutional differences, and other challenges that can be expected working in a joint, multi-component environment during combat operations. They forged a legacy of cooperation across cultural and operational lines of services that provide a better understanding of capabilities across the entire joint engineer team.

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Lieutenant Colonel Anderson is the commander of the 46th Engineer Battalion, 130th Engineer Brigade. Previous assignments include platoon leader and executive officer, 52d Engineer Battalion (Combat); staff officer and bridge company commander, 36th Engineer Group (Combat); battalion S-3 and executive officer, 84th Engineer Battalion (Combat) (Heavy); and staff officer, Office of the Chief of Engineers, Headquarters, USACE. She holds a bachelor's from the University of Southern Colorado and a master's from the University of Georgia.

Assured Mobility Through Synchronization: Taking on the Counter-IED Fight

By Captain Amber N. Schleuning

As corps engineers during Operation Iraqi Freedom (OIF) 05-07, the 130th Engineer Brigade assumed the responsibility of clearing the Multinational Corps–Iraq (MNC–I) main supply routes (MSRs) of improvised explosive devices (IEDs) and other obstacles. Clearing IEDs proved to be a challenge not only tactically, where the rubber meets the road (*we were reminded every day that the enemy "has a vote"*), but also operationally, at the brigade level of planning and decision making. The fundamentals of assured mobility were identified and understood early in the fight. The challenges were nested in the resources.

Situation and Mission

The mission of clearing the MSRs was given to the 110th Engineer Battalion, which was under the operational control of the 130th Engineer Brigade in support of OIF 05-07. Working in teams, the battalion cleared IEDs, unexploded ordnance (UXO), and other hazards in an area of operations with more than 300 kilometers of roads, dirt, overpasses, and canals. The goals were to clear the routes for coalition forces and deny the anti-Iraqi forces terrain and freedom of maneuver. Daily clearances required the route clearance teams to travel diverse terrain and urban environments, in addition to several different operational environments, making seamless movements difficult.

The 110th developed a working relationship with maneuver elements involved in their current operations. As the route clearance teams or operational environment owners discovered IEDs, the site was cordoned off, the incident was reported among forces, cordons were turned over, and details were exchanged. With the brigade mission of *assuring mobility*, the focus was on long-term operational planning. The counter-IED fight was more pervasive than the day-to-day success of the route clearance team. To achieve absolute success—allowing the force commander the ability to move and maneuver where and when he desired without interruption or delay—the fundamentals of assuring mobility needed to be properly executed.

The six fundamentals of assured mobility are—

- *Predict* actions and circumstances that could affect the ability of the force to maintain momentum.
- *Detect* early indicators of impediments to the battlefield mobility using intelligence, surveillance, and reconnaissance (ISR) assets; identify alternatives; and establish surveillance.
- *Prevent* potential impediments to maneuverability from affecting the battlefield mobility of the force by acting early; monitor and protect cleared routes.
- *Avoid* detected impediments to the battlefield mobility of the force; if prevention fails, identify alternatives.
- *Neutralize*, reduce, or overcome (breach or, in this case, have explosive ordnance disposal personnel destroy or remove) impediments.
- *Protect* against threat force weapons and tactics, techniques, and procedures through the application of technology or tactical behavior. This is a continuous process.

Assured Mobility Basics
From the Corps Engineer Brigade Commander's Perspective

- Get the most out of and integrate enablers to attack the enemy across the spectrum of countering IEDs from *predict* to *protect*—this is a combined arms fight.
- Set and sustain a team objective to achieve success in assured mobility.
- Ensure a steady state of give and take between maneuver and route clearance teams.
- Consistently share analysis with brigade combat teams (BCTs) and task forces. Everyone adds a piece to the puzzle to defeat the enemy's actions.
- Integrate with operational environment owners—frequent face-to-face coordination and liaison officers are essential. Constant communication is essential because the battlefield changes constantly.
- Synchronize with maneuver combat patrols.
- Coordinate and share information with MSR users.
- Execute proper tactics, techniques, and procedures. Ensure security always.
- Protect Soldiers and equipment.
- Increase route clearance team time by embedding explosive ordnance disposal (EOD) assets rather than waiting for EOD personnel.
- Sustain an aggressive route sanitation and crater repair program.
- Predict and make the right changes. Don't get into a rut with route clearance scheduling and targeting—the enemy is always changing.
- Work hard every day to make a difference.

A route clearance team searches for IEDs and UXO.

Brigade Operations in Synchronization

In order to "hit on all cylinders" in the counter-IED fight, the 130th Engineer Brigade created an Assured Mobility Synchronization Cell (AMSC). Field Manual (FM) 3-34, *Engineer Operations,* cites assured mobility as the actions that guarantee commanders the ability to maneuver where and when they desire without interruption or delay to achieve the mission. It requires the understanding of the friendly and enemy actions and the three-dimensional operational environment (subterranean, ground level, and aerial) to permit commanders to act first within the threat opponent's decision cycle. Thus, the cell's mission housed the six fundamentals aiming to track and synchronize route clearance teams, logistical convoy movements, maneuver operations, ISR assets, and other engineer enablers.

The AMSC's first priority included determining the steady state maneuver missions, operational environment owner clearance efforts, and combat patrol capabilities. A detailed targeting process allowed the AMSC to position the route clearance teams so they achieved "time on target" and were integrated in and around ongoing maneuver combat patrols. Adding the layer of tracking logistical convoys, the AMSC needed to ensure that the routes were cleared of IEDs and UXO to safeguard the timely movement of personnel and equipment in-theater. Finally, acknowledging that the threat was *thinking* and would *adapt* to our operations, ISR (the combat multiplier) assets were overlaid and tracked.

Conclusion

The dynamics and resources available in Iraq are constantly changing. Every rotation is unlike the one before. This article is offered as after-action review comments that might possibly be integrated into planning and considerations for the "next round." In the end, the constant that remains is the need for a combined and synchronized force when tasked with the mission of assuring mobility. Without the synchronization of the force, success in the fundamental engineer task of assuring mobility will always be in question.

Captain Schleuning is the 130th Engineer Brigade Assured Mobility and Synchronization Cell officer in charge, deployed in support of Operation Iraqi Freedom 05-07. Previous assignments include platoon leader during Operation Iraqi Freedom, assistant S-3 operations officer, and brigade maintenance officer. She holds a bachelor's in biology from the University of Colorado, Boulder, Colorado.

Powering the Forces

By Captain Esther S. Pinchasin and Captain James S. Boyette

The 249th Engineer Battalion (Prime Power) trains for worldwide deployment to provide prime power electrical solutions and electrical-systems expertise in support of military operations and the National Response Plan. Operation Iraqi Freedom continues to present daily challenges of environmental and logistical obstacles, which the "Black Lions" successfully overcome. Gone are the days of the quick-and-easy Force Provider module forward operating base (FOB) in a box! Our restructured footprint requires comprehensive and flexible power planning, and the prime power production specialists provide the knowledge necessary to meet the theater's increasing power requirements.

Soliders splice a medium-voltage distribution cable.

The Soldiers of the 249th Engineer Battalion possess a variety of capabilities to support military operations, such as installing and operating prime power plants, providing technical power-related guidance, and serving as technical assistants to the contracting officer's representative (COR) for power projects. The Army's prime power production specialists assist in the connection of base camps to local commercial grids (which establishes the secondary backup system and helps eliminate the dependency on contracted power generation equipment). This is not currently being accomplished in Iraq because the national grid is unreliable and incapable of providing consistent power to the Iraqi population. The final objective and a measure of success will be the connection of bases to the commercial grid, utilizing it as the primary power source.

Military-constructed and leased power plants provide electricity for all contingency operating bases (COBs) in Iraq. The smaller FOBs are powered solely by spot generation (which consists of many low-voltage generators referred to as tactical generators [TACGENS]). The Soldiers of the 249th support base commanders and area support groups in their efforts to maximize the use of the government-purchased and leased power generation systems, implement load-sharing programs during peak power demands, and ensure the safe and efficient operation of the utilities infrastructures sustaining allied forces.

In 2003, the existing electrical infrastructure at most of the COBs was cannibalized, destroyed, or severely damaged. The 249th conducted battle damage assessments and repaired enormous portions of the distribution systems to enable operations. They put miles of power distribution lines in the ground and stood up life-support areas all over Iraq. Since then, power production equipment has been leased and purchased, and the role of the 249th has changed to one of assisting the Multinational Corps–Iraq (MNC–I) with the proper utilization of the newly acquired resources.

Prime power specialists have been conducting electrical assessments of facilities, compiling required bills of materials, computing load estimates and projected power requirements, as well as designing and installing low- and medium-voltage power distribution systems for base engineers. They have taken on the critical tasks of overseeing project execution, ensuring the quality control of the contractors' work, and providing technical assistance to both theater and the United States Army Corps of Engineers® CORs.

At one logistics support area (LSA), the 249th oversaw the construction and installation of overhead power distribution lines covering the entire base, to ensure that the Army received what it paid for with taxpayers' dollars. The LSA had more distribution capability than power available, which is rarely the case; therefore, the plan was to double the size of the existing plant and provide power to more than 90 percent of

A Soldier works at troubleshooting an electrical fault.

the base, using minimal spot generation. This directly reduced fuel and maintenance costs and maximized power production capability on the LSA.

A prime power team at one COB in Iraq worked diligently to stand up utilities operations. The base is mostly powered by costly spot generation—which is operated, maintained, and fueled by contractors. The objective was to reduce our dependency on the inefficient spot generation and utilize more of the leased-plant capacity. The prime power team also assisted in upgrading the electrical infrastructure, provided quality control for the contracted work, and completed several technical troop-labor missions. The 249th worked aggressively to connect to the existing grid the major power users, the critical facilities, and the facilities that do not require an extensive bill of materials. Working alongside the MNC–I C-7 (engineer staff section) Power Cell, they produced a theater power plan to meet future power demands and assist in the programming of funds for upcoming power production requirements. The current plan, to add megawatts to the COB power plant, will guarantee power support to the base. The 249th engaged in assessing and prioritizing facilities to carry out this course of action and guarantee the COB's ability to handle the summer power surge demand.

Over the last twelve years, the 249th has deployed and worked with engineers from all over the world. However, in Iraq, they had the rare opportunity to work directly with United States Marines at a base that was abandoned by the Iraqi army and subsequently looted, rendering the main power bunker inoperable.

Most of the distribution system was in a horrible state of disrepair, and all the substations were nonmission capable. They were directed to restore the power distribution system, which was accomplished successfully with limited resources and materials. These prime power production specialists repaired the existing internal electrical systems and enabled occupancy of the buildings on the COB.

They also located and disabled high-voltage feeder cables to the base, arresting the barrier system without any electrical diagrams, required tools, or diagnostic equipment. They resourcefully consolidated all unused transformers, switchgear, and high-voltage rated cable to quickly determine the serviceability of each item and set up a cannibalization, testing, and repair shop to repair complete substations with zero cost to the U.S. government. The prime power Soldiers conducted reconnaissance and assessment of more than 200 facilities and collected repair parts and materials to restore the electrical capability to each facility.

Today, the 249th continues to build on past successes. It works closely with the area support group's electrical team to repair and maintain the power distribution system and supervise the operation of the base-leased power plant. The team also repairs cable strikes, conducts substation maintenance and repair, and corrects faults in the underground distribution infrastructure—which was built in the early 1980s. The unit is also looking ahead and working on the expansion of the power plant and has already developed the power projections.

The 249th Engineer Battalion, the only prime power unit in the Army, is comprised of professional Soldiers who are the theater's technical experts on commercial-grade medium-voltage power. They continue to operate out of the major COBs in Iraq, supporting the entire area of operations, providing the outlying FOBs with technical expertise, and identifying life-threatening electrical safety hazards. The Soldiers of the 249th will continue to rotate in and out of Iraq and Afghanistan, covering both areas of operations, to support thousands of U.S. Soldiers, Sailors, Airmen, and Marines.

Captain Pinchasin is attending graduate school for construction engineering at Stanford University and will serve with the United States Army Corps of Engineer upon graduation. Her previous positions include platoon leader, executive officer, S-3, battalion S-4, company commander, battalion liaision, and adjutant. She holds a degree from Boston University and has attended the Aviation Captains Career Course and Combined Arms and Services Staff School (CAS3).

Captain Boyette is a small-group instructor for the Engineer Officer's Basic Course. His previous positions include platoon leader, support platoon leader, executive officer, assistant S-3, and battalion liaison officer. He has a bachelor's in management from National American University.

The Corps Engineer Brigade Construction Mission—

A Joint and Combined Arms Effort

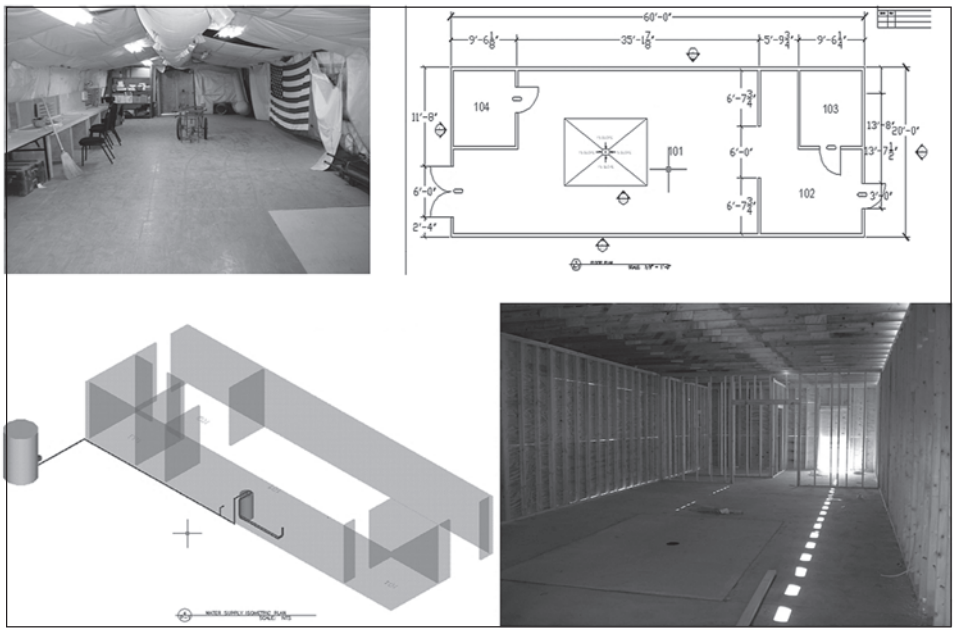
By Major Tyrone Bennett

As military engineers continue the transformation process, the corps engineer brigade is continuing to provide senior engineer leadership by focusing on the corps commander's priorities within the area of responsibility (AOR). Will this association become a thing of the past, or will it remain steadfast in the current command and support structure? In the meantime, the missions keep coming. If the corps is serving as the joint task force (JTF) or Multinational Corps, then the subordinate engineer brigade is equally postured for command and control of the engineer structure. The responsibility of providing construction and master planning during current operations spans all the services, to include specific Army branches. The corps engineer brigade has a unique challenge of balancing the corps's priority for the construction and master planning effort with an inherent relationship with the United States Army Corps of Engineers®—which is the Gulf Region Division. The invariable requirement for continued infrastructure improvements, to include assured mobility, has prompted other services and Army branches to become noticeable contributors in the overall processes.

The joint and combined arms involvement is visible when other services provide their construction and master planning unit in lieu of an unavailable Army capability normally under the corps engineer brigade's command and control. Some examples of the in-lieu-of capability are showcased by the United States Air Force's facility and utility detachments. The combined arms effort is not as perceptible and does not fall under the corps engineer brigade's direct control, but these units are equally as important to the construction and master planning effort. A few of the primary contributors to the combined arms construction effort to highlight include finance and contracting, Defense Contracting Management Agency (DCMA), and almost every aspect of logistics (corps support command [COSCOM]). All services are transforming, and units are receiving updated nomenclatures.

The effort provided by the Air Force facility and utility detachments is clearly defined: They are replacing similar Army facility engineer teams (FETs) and utility detachments because these particular standard requirements code (SRC) units are not available or are just off-cycle for purposes of operational rotations. It's very apparent that strict attention should be given to certain low-density SRC units that have witnessed the brunt of the engineer's operational turbulence. The continuous and sometimes increased need for utility

The versatile 803d Utility Detachment executes various missions: Top left – final grade for vehicle staging area; Bottom left – fence improvements for force protection; Top right – traffic speed bump emplacement; Bottom right – final survey shots for drainage and elevation.



An example of design work provided by the 732d Expeditionary Civil Engineer Squadron, Facility Detachment 15: Top left – expeditionary mortuary affairs operation; Top right – modified Southwest Asia (SWA) hut design to replace tent; Bottom left – 3-D view of structure with drainage system; Bottom right – construction of new mortuary affairs facility.

detachments and FETs are trends that must be addressed sooner rather than later.

The Army and Air Force utility detachments are valuable when it comes to making immediate impacts to infrastructure improvements and the construction of almost any type, not to exceed certain project scopes. The Army made a doctrinal decision in the late 1980s to move all utility detachments to the Reserve Component. This positioning decision may take another blow if current transformation plans completely eliminate the SRC. As a result of the increased need and almost uncontrollable operating tempo (OPTEMPO), the requirement for utility detachments has spilled over to the other services—the Air Force being the first formalized contributor. Currently, the corps engineer brigade is responsible for managing all of the utility detachments in the present operations within the corps's AOR.

The Army FETs are also a much sought after, low-density engineer unit whose existence became essential dating back to the Balkans. The turbulence from the current operations has prompted the Air Force to provide an equivalent capability in lieu of the stretched Army FETs. The Air Force facility detachments are assembled individual skill sets based on the Army FET structure and have successfully delivered the master planning needed under the corps engineer brigade's requirement for managing a master plan at the priority base camps.

There are some unique challenges that accompany every joint effort, regardless of the familiar skill sets. After working with sister services in a joint military construction effort, frequent challenges with processes used for resourcing the projects have become apparent. Every service has its own process for requisitioning and funding projects, but in a joint environment all services must increase the synergy around the particular service recognized as the executive agent. All too often, requesting agents or customers focus solely on the engineering aspects of the construction requirement, and the material requirements start off behind the timeline—thus creating a project lag.

Preventing a project lag is where the combined arms concept becomes apparent and very essential to the timeliness of the project. The military construction designs can be performed by Soldiers or civilian engineers, but both options require assistance from finance and accounting. The DCMA has area contracting officers who help enforce government contract standards in support of military bases. Ultimately, DCMA is responsible for ensuring that federal acquisition programs, supplies, and services are delivered on time. Normally, the requisitioning unit relies on the military's supply system and transportation units to deliver precious material. This all seems like a routine process until another service attempts to use an unfamiliar process like this from beginning to end.

As the number of engineer brigades is reduced, the versatility of existing brigades operating in support of the deployed corps headquarters will continue to increase across service lines. The Army is seeing the Air Force take an active role in filling requirements in lieu of Army units like the FETs and the utility detachments. There are several key Army branches that have some critical, behind-the-scenes roles regarding successful construction projects within the corps engineer brigade and throughout the corps's AOR. As the Air Force and other services take on additional responsibilities in the theater of operations, the need for understanding the Army's processes will become an overarching task. The utility detachments are underappreciated and should remain in the structure as versatile construction units.

Major Bennett is the S-3 construction officer for the Multinational Corps–Iraq Corps Engineer Brigade. Previous assignments include Korea, Fort Stewart, Haiti, Fort Bragg, Fort McPherson, Saudi Arabia, and Germany. Previous duties include bridge platoon leader, facilities engineer, company commander, and plans and operations officer.

DO YOU THINK OR DO YOU KNOW?

By Staff Sergeant Travis Y. Johnson

Knowing the answer to the question "Do you think or do you know?" can mean the difference between success and failure during a deployment. What you *think* is something you've been told. What you *know* is what you have done or seen. For example, surveying in an underdeveloped nation or nonpermissive environment is not the same as surveying in a peacetime western environment. Successful predeployment training and relief in place (RIP)/ transfer of authority (TOA) when arriving in-theater will close the gap between the two and set the stage for successful deployments. The missions may vary a great deal, yet it all comes down to whether or not personnel think they know or actually know successful deployment procedures. While supporting the 130th Engineer Brigade in Iraq, Detachment 8, 412th Engineer Command (ENCOM), United States Army Reserve, was given survey missions that required all of their combined civilian and military backgrounds. This included previous continental United States (CONUS), overseas, and combat experiences molded into a proven procedure: beginning in predeployment training, continuing through RIP/TOA, and being continually refined during operations in Iraq. This successful deployment procedure involves more than the simple collection of data and can be broken into six steps. The unit—

- Must have the proper equipment for the job (most important).
- Should have training beyond the basic "schoolhouse" understanding of the equipment.
- Must have an understanding of survey principles and be able to apply them to the mission.
- Must know what data collection standards are required.
- Should be prepared for theater-specific issues.
- Should be prepared for changes.

Photo by Staff Sergeant Travis Y. Johnson

Two survey Soldiers take field notes and set up the Geodimeter 5600.

If not managed correctly, all these things (individually or collectively) can lead to mission failure or loss of a Soldier. In-country survey missions should only be done once. Sending a team twice due to mission failure in CONUS just means that time was wasted, but sending Soldiers back out in a combat theater can cost lives.

Tools of the Trade

Total Station

The traditional survey tool is a "total station," which is a conventional survey system with an instrument usually referred to as a *gun*, plus required prisms, poles, tripods, batteries, and tripod-mounted levels called *tribrachs*. Until recently, the Army version of this set was the Geodimeter® Automated Integrated Survey Instrument (AISI) 444. This instrument is more than 13 years old and

is no longer used professionally in surveying. To meet mission requirements, Detachment 8 acquired the Geodimeter 5600 Servo Direct Reflex (DR) 200+ with the Trimble® Automated Control Unit (ACU) Survey Controller as the gun. The gun is capable of measuring 5,500 meters to a prism with two-second accuracy over that distance or roughly 5 centimeters. This is a line-of-sight system and was acquired with global positioning system (GPS) gear to be used as a stand-alone system or together. Although not standard military equipment, the United States Army Engineer School, Fort Leonard Wood, Missouri, recently adopted the 5600 gun with a slightly different control module, the Geodimeter Control Unit (CU), which is more closely related to the AISI 444 operational procedures.

Global Positioning System

The GPS acquired to meet mission requirements is the Trimble 5800 Real-Time Kinetic (RTK) Rover. The main component is the Site Positioning System (SPS) 780 Rover series with base option, which is an antenna that can be used as either a GPS base station or as a rover. A rover collects RTK GPS data while moving. The rover vehicle can be any platform, but is typically an all-terrain vehicle like the Polaris Ranger® 4x4, which needs only minor modifications to mount the survey rod. This GPS requires an attachable data collector, the Trimble Survey Controller 2 (TSC2), which can be interchanged with the base, the rover, or the gun. This system measures at an unadjusted accuracy of 1 to 3 centimeters.

Software

The Army trains and supplies Terramodel™ civil design software developed to use with Trimble equipment. Other software supplied and trained by the Army is AutoCAD 2004, but AutoCAD 2004 Land Desktop Development (LDD) and other Autodesk civil design series components are also available. Conversion and data management software packages are required, such as Geotrans V2, Convert 4.08, Trimble Data Transfer, and Trimble Geomatics Office. No single software package could satisfactorily meet all missions; the combination of all this software was essential to the various missions and their changes. Nontechnical but important software in creating a final product is Adobe® Acrobat® Professional, which allows almost any technical output to be made into a portable document format (PDF) that any client can view.

Predeployment Training

Predeployment training is mandatory for all deploying Soldiers. There are core, theater-specific tasks, such as convoy operations, that all services mandate. Military occupational specialty (MOS) 21T technical engineer specialists, like all Soldiers, need to train in their job-specific tasks. However, unlike 21B combat engineers, 21Ts are low-density, and not many qualified and experienced trainers are available. A 21T must be an expert not only in surveying but also in drafting, computer-aided drafting (CAD), soils analysis, concrete quality control, and other critical technical engineer jobs that require considerable training and experience after the initial schooling (military or civilian). If they only have schoolhouse or basic MOS training, the odds are that they only think they know the job.

A train-the-trainer atmosphere is perfectly suited for correcting this problem. Given sufficient lead time, a 21T trainer from the Engineer School or from a training brigade may be available. Local vendors for survey equipment may be able to provide hands-on training that can be very important. Even a single experienced noncommissioned officer can successfully mentor school-trained Soldiers during predeployment training. It is also important that unit leadership be thoroughly familiar with all the software, hardware, and applications in order to set the missions for success in planning, logistics, and specifications. Finally, advance coordination with the unit being replaced can ensure that "right-seat/left-seat" training (working side by side with someone familiar with the job), using actual ongoing missions, will use the RIP/TOA period to build on predeployment training and bring the incoming unit up to full speed.

General Survey Principles

There are a few general survey principles that need to be reinforced during predeployment training. These principals are proper point coding, site identification, and the location or placement of benchmarks. Errors in these tasks must be caught and corrected on-site, without slowing the progress, or the entire survey could be wasted. Drilling the steps for each principle as a battle drill would ensure the Soldiers' confidence both in themselves and the equipment.

Point Coding

Proper point coding steps vary with the equipment, but the principle remains the same. Point coding is how the surveyor assigns identifiers to points. Often a 21T other than the surveyor uses the data to develop drawings. There may be multiple surveys, potentially creating confusion with data sets. Some coding conventions will not be read in by the software. You have to know your equipment. Having a key to the codes as part of the job files eliminates whether people know or only think they know the data codes.

Site Identification and Benchmarks

Proper site identification and benchmarks are also important for mission success. Do the surveyors know that they have enough data at the end of a mission or do they only think they have enough? Everything should be collected. Experience shows that projects can expand or become new projects. In-theater, many clients don't fully understand how to translate their needs into technical requirements that can also result in additional work. Extra data can make a new survey unnecessary. Available benchmarks should be located in all surveys. Benchmarks make project handoff, map location, and accuracy markedly better. Also, proper field notes streamline surveying, data use, and the ability to effectively change in the middle of a mission.

Photo by Sergeant Adam Russell

A Soldier stakes off a base station setup, which is a temporary benchmark for the survey.

It is better to have the data and not need it than to need it and not have it. However, time constraints can make it difficult to get these extra details, particularly if the survey crew has to take considerable time on-site working out the details of the survey. A site visit before the survey with all key project members—to include the client, the designers, and the construction supervisors—is essential for mission success. It ensures that the survey leaders can better plan the site work by seeing it, the client's needs are worked out on the ground and understood by all, and data needs are thoroughly understood.

Collection Standards

Do the survey crews know how to perform the survey accuracy standards for the mission? The civilian standard of surveying is much more stringent than that of an average military surveyor, yet those higher standards are required for United States Army Corps of Engineers® or military contract projects that the surveys support. The difference is in accuracy and legality. Civilian surveyors are required to know property laws and geospatial information systems (GISs) and be able to pass licensing exams. In most states, they must have attained a bachelor of science degree. Military surveyors are not held to the same standards. However, in-theater missions can require civilian levels of expertise, and not being able to execute those missions can delay large projects until civilian contractors are available and funded.

Something normally practiced by civilian surveyors, but not by the military, is the use of an Online Positioning User Service (OPUS) for GPS coordinate correction. This system has been recently set up in-theater and is monitored regularly. The website is <*www.ngs.noaa.gov*>. Using this service ensures that the surveyors and designers know that benchmark data is correct rather than only thinking that it is.

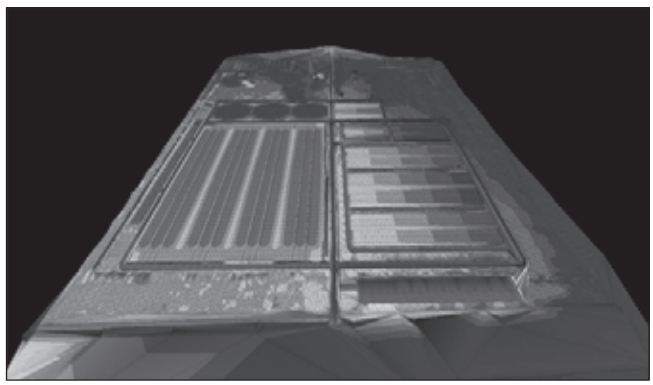
Theater-Specific Encounters

Force Protection

Force protection is always an issue in-theater. The leader for any mission should know the potential threat for the site and for travel to the site. Unexploded ordnance (UXO) could be found on a base where future construction is planned. A route survey can encounter improvised explosive devices (IEDs) and small arms fires. Even secure bases can receive mortar or rocket attacks. These are just some of the challenges survey teams have experienced. Unit planning must ensure that all coordination is made, to include accounting for the amount of equipment being transported for a mission and ensuring that the security team understands the needs of the survey team. Environmental considerations include high heat, wildlife (such as scorpions and vipers), and cold weather or rain (depending on the location and the season).

Drainage

Drainage is a significant issue in-theater for surveyors as well as for designers. The soils in many of Iraq's populated areas are alluvial silts that seal against water shortly after being wetted instead of allowing water to filter into the ground. The topography of most bases is flat and not conducive to proper drainage. On many bases, gravel is used to "put boots and wheels above the water." This makes the situation worse. Units are in-theater for a year or less and typically do not see the long-term effects. For the surveyor, it may mean recording a point on the top of the gravel and then digging below the gravel to record a point at ground level, both for drainage and



After using a rover-mounted GPS to survey a 1,000-acre site in southern Iraq, a comprehensive drainage plan was developed from the 3-D data using Terramodel.

gravel removal. A site must be designed to drain properly by not draining into another site, which would cause problems there. All drainage structures have to be identified and verified by the surveyor. Whether a site or project will drain properly is something that one must know and not just think they know. Aside from making the area a muddy waste, improper drainage can undermine slabs, roads, and other structures and allow pooling for insect breeding.

Global Positioning System Capability

Several units in-theater have reported a lack of GPS capability. This is in direct relation to them thinking they know the equipment and actually not knowing it. The GPS will likely encounter problems, and a thorough knowledge of the systems is required to fix these problems. Another common issue is GPS elevation variances that do not match the topography across a project. The fix for this is to place multiple base station control points on-site and locate them relative to each other, then use differential leveling within the software package to eliminate the error. A second fix for this problem is to do a "cooked point," which takes at least three hours of data collection in a FastStatic or similar surveying procedure, and send the data files in a receiver independent exchange (RINEX) format to OPUS for correction.

Operations

Equipment Assignment

Proper equipment assignment is important to individual and collective mission success. Does the team leader think he knows all mission requirements or does he really know? Really knowing is a significant challenge. The survey team leader is usually the person who must take the supported unit commander's intent and translate it into technical requirements. For example, a mission may seem to be a perfect application of GPS based on a map reconnaissance; yet once in the field, the line-of-sight gun may be what is needed. The GPS is best-suited for large, open, and unobstructed areas. If there are large concrete buildings or bunkers that block the GPS signal, the gun may be better. Small projects requiring total accuracy are also best-suited to gun usage. The concern about this is balancing whether the unit becomes mission incapable for other missions by sending all equipment to one area against whether a mission can be done with only one. Is there another unit nearby that can help? The United States Army, Air Force, and Navy engineer units can usually help each other if there is advance coordination. Can measurements be taped off and recorded in the field notes instead of using a gun? The mission planner needs to know all resources and methods available to balance current missions against planned missions, as well as any high-priority "short-fuse" missions that may occur.

Mission Creep

Mission creep is how a mission can begin small and become large. Mission creep often occurs when the survey crew thinks they know the mission instead of actually knowing it. Once on-site, the customer usually tries to get additional tasks completed. There is often a mentality of "I have you here now, and I'm going to keep you," because demand is high for in-theater engineer resources, particularly if the client knows that 21Ts have more skills than just surveying. The team leader must know the mission's scope of work, the commander's intent, the unit's full capabilities, the designers and surveyors, and upcoming missions. Typically, a mission directive will give the team one goal and a specific timeline. Often it's good to do extra work within that timeline, because it provides good will and takes care of the supported unit's missions. Other times, the supported unit's "nice-to-have" want would be at the expense of another mission's "must-have" need. The on-site team leader and the unit's operations section must have a firm grasp of the current and projected workload to balance these priorities.

Changes in Focus

Focus changes are a normal occurrence in theater operations. What the unit may think is their mission is what they were trained on or told prior to deployment. What the unit will know is that their mission is what they will encounter in-theater. This happens across all coalition activities, not just engineering, because coalition governments shift priorities, military missions change, the anti-Iraqi forces change tactics, and engineering priorities change. A survey can be top priority one day, and the next day it can be low priority or canceled. Units being told they will be doing a lot of surveys or few surveys based on current or past Operation Iraqi Freedom cycles may find a different reality on the ground. The only solution is to be prepared and remain flexible. Thinking and knowing is measured on a graduated scale, based on the collection of factual data over time. As such, the facts in-theater will change regularly, and what you know to be the mission today may not be the mission tomorrow.

Conclusion

Surveying in a nonpermissive environment is vastly different than in CONUS. The timelines allowed and the safety considerations put the two environments on different ends of the spectrum. The difference between what you think and what you know of the equipment, personnel, principles, standards, environment, and operations is vital to success in-theater. Soldiers of all ranks need to understand this to ensure that all criteria are met and that all Soldiers return. An improper survey resulting in an improper design can mean lives lost. That is a risk that we, as military surveyors, cannot afford. Ensure that your Soldiers know what is necessary and are prepared for it.

Staff Sergeant Johnson is the Construction Management Section NCOIC for Detachment 8, 412th ENCOM, supporting the 130th Engineer Brigade in Iraq. He has been a United States Army technical engineer for 9 years and a civilian surveyor and civil/mechanical designer for 12 years. He has led military survey missions in CONUS, Korea, Germany, Italy, Kosovo, Bosnia, the Marshall Islands, and Iraq, as well as civilian survey teams in six states.

Continuous Kinematic Surveying Throughout Iraq

By Second Lieutenant Jonathan Wilson

As the military continues to develop its contingency operating bases (COBs) and create improved facilities and living accommodations for its Soldiers, the demand for military surveyors increases. Surveyors in Iraq have a vital role, ensuring that both military and civilian engineer planners have accurate designs and topographic products necessary for planning construction and improvements. The increased demand for surveys requires new technology, equipment, and methods to obtain rapid and accurate results. One piece of equipment in particular, the Trimble® 5700 Global Positioning System (GPS), proved invaluable to the Survey Platoon of the 320th Engineer Company (Topographic), 130th Engineer Brigade, as it conducted numerous missions across Iraq.

Applications

The Trimble 5700 is a versatile piece of equipment that can be used under most surveying conditions. Within Iraq and the scope of military surveying, the most beneficial use was the continuous kinematic collection of survey points. This function fulfills the purpose of developing comprehensive topographic maps at a rate previously unattainable. Throughout the theater of operations, there are

An Army Soldier uses a Trimble 5700 during a survey mission.

"Over the course of three weeks, the platoon put the Trimble 5700s to the test, collecting more than a quarter million data points in an elaborate grid spanning the area."

little or no detailed contour maps. Although the country is predominately desert, rainfall can average up to 100 centimeters in some areas during the rainy season. The sudden addition of water creates massive flooding in regions that were previously dry. Thus, it has become the focus for many design management sections (DMSs) to plan and develop drainage and flood mitigation plans for their forward operating bases (FOBs) and logistics support areas (LSAs).

In order for a DMS to accomplish the lengthy task of flood control planning and construction design, it first needs a final survey product. The survey product includes a thorough topographic contour map of the surveyed area. The development of a contour map involves a lengthy process of surveying a wide area in a specified grid pattern. Typically, a 50-foot interval is used to create a grid of points from which extrapolations can be made for relief. In the past, this process required one surveyor with an optical total station (a tool used to sense position) to take individual shots as a rod man (raises or lowers the target until the surveyor signals that it is at the proper height) moved from point to point along the set grid. But now, with modern technology and the addition of the Trimble 5700 to the Army surveyors' basic equipment list, all of these tasks can easily be accomplished in a fraction of the time.

Continuous Kinematic Surveying

The Trimble 5700 allows you to select the desired time interval that you want to use. Then, the instrument with its built-in satellite receiver measures a point at that time interval. Essentially, the instrument only needs to be kept at a steady height—on a Soldier's back or attached to a vehicle. The Soldier continually walks or drives the area. If tasked with a site survey, to include drainage for a motor pool or other confined areas, only one Soldier is needed to walk the grid pattern. If the area is larger, a contour map is developed and the instrument is placed on top of the vehicle with magnets. The vehicle then drives the pattern. A 15-second interval is optimal when walking, and when driving, a 5-second interval is optimal as long as the vehicle remains at a slow speed.

Once the surveyors collect all of the raw field data, it is processed. Trimble Terramodel™ is one software program that is compatible with the Trimble 5700. The program takes all of the points, inputs them, and connects all of the points of equal elevation and develops a complete contour map for the DMS to use in its planning and designing.

Put to the Test

All of the beneficial aspects of the Trimble 5700 system were put to use recently by the Survey Platoon of the 320th. As the war evolves in Iraq, many of the smaller FOBs are becoming obsolete, and thus it has become a military endeavor to consolidate its forces into more centralized hubs. The 555th Combat Support Brigade (Maneuver Enhancement) DMS has been charged with the mission of developing all the plans necessary for future Soldiers into COB Speicher. In order for the 555th to complete its mission and correctly make all of the designs for the COB, it first needed to know the existing conditions of the area.

The Survey Platoon began the process of surveying COB Speicher, which was flooded throughout the rainy season. For the 555th personnel to combat and mitigate the flooding, they needed to know the total volume of runoff entering the COB and where all of the water was flowing. They created a detailed contour map of the entire COB, as well as the surrounding watershed, for drainage assessment and planning.

Over the course of three weeks, the platoon put the Trimble 5700s to the test, collecting more than a quarter million data points in an elaborate grid spanning the area. They also extended their survey beyond the perimeter to encompass the surrounding farmlands. With an elaborate grid of points collected—each point a precise coordinate and orthometric (height of a point on the earth's surface) elevation—the platoon compiled and processed all of the data. The result was a comprehensive and thorough topographical contour map of the entire installation with decimeter interval precision.

Mission Success

The Survey Platoon has made efficient and valuable use of the Trimble 5700 survey system throughout the country. With it, the platoon has created comprehensive and thorough maps of several FOBs in less than half the time it would have taken using older methods. The Trimble 5700 is a reliable and beneficial piece of equipment that was used in the collection of more than half a million survey points at a rate previously unmatched by other surveyors.

Second Lieutenant Wilson is the survey platoon leader for the 320th Engineer Company, 130th Engineer Brigade. Throughout Iraq, the platoon has performed numerous surveys to include site, topographic, construction, and hydrologic surveys.

MORE THAN MANAGEMENT

By Major Clarence B. Kemper

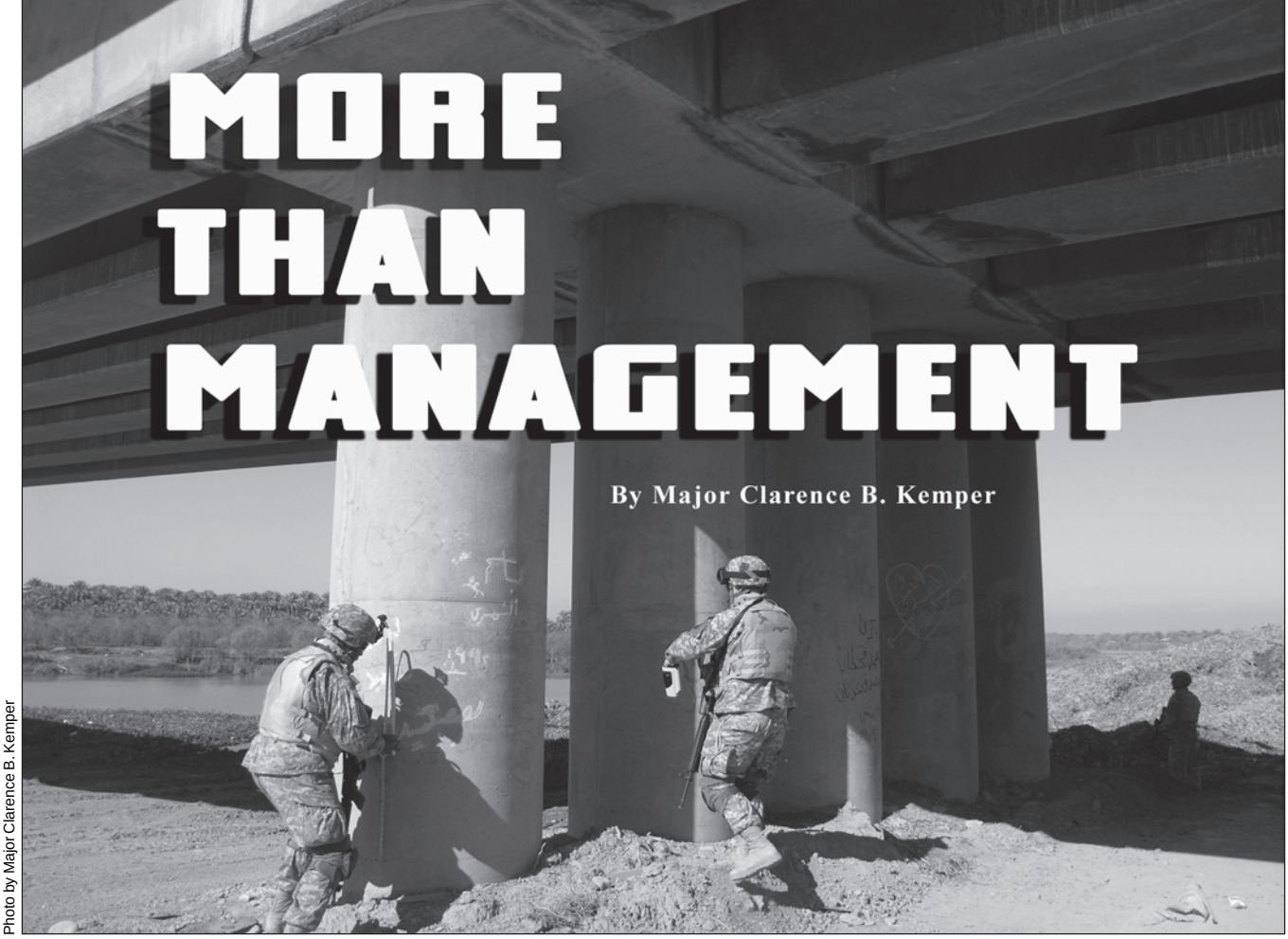


Photo by Major Clarence B. Kemper

Whether you call the collection of military occupational specialty (MOS) 21T engineer technicians and 21D facilities/contract and construction management engineer officers a construction management section (CMS) or a design management section (DMS), the word "management" seems to be the operative word. Usually found in engineer groups and brigades, the CMS and DMS traditionally act as a small engineering firm, providing surveying, design, soils testing, materials testing, and quality assurance/quality control (QA/QC) for construction, materials, and drawings to supported units. When Detachment 8 was formed from the 412th Engineer Command (ENCOM), United States Army Reserves, to support the 130th Engineer Brigade as its CMS or DMS for Operation Iraqi Freedom, it was known that the mission would be more than just management.

The commander of the 130th knew that the brigade would have a wide range of missions. It would be responsible for maintaining and improving contingency operating bases, developing convoy support centers, and overseeing various technical units such as facility engineer teams (FETs), engineer utility detachments, and United States Air Force (Civil Engineer) detachments. These responsibilities would be in addition to the traditional brigade role of providing command and control for combat engineers, construction units, and bridge units and dealing with Iraqi infrastructures. The commander also knew that beyond the traditional role of a CMS or DMS, this kind of organization (from the Reserve Component) offers experienced individuals with real-world engineering experience.

Formation of Detachment 8

The 130th Engineer Brigade is based in Hanau, Germany. The 412th area of responsibility includes the United States European Command and the United States

The photo above shows output from the USACE Automated Recon Recording Kit, which integrates video capture and voice recordings while storing the vehicle's coordinates and gyroscope data as it travels.

Photo by Major Clarence B. Kemper

A Soldier records measurements during a bridge reconnaissance on the Tigris River.

Pacific Command. While many of the Reserve Component engineer brigades have a CMS or DMS, the Active Army combat engineer brigades no longer have these assets. When the 130th requested technical engineering support for various Iraq-specific missions, the United States Army Forces Command tasked the 412th to provide a team. The result was Detachment 8.

The 412th ENCOM provides command and control for theater engineer operations, with its primary mission being the Eighth United States Army and the Korean Peninsula. However, the unit also has a large number of MOS 21T Soldiers and 21D officers who stay engaged in technical engineering missions throughout the United States, Europe, and Asia, in addition to unit participation in annual joint multinational exercises in Korea. Multiple detachments and individual augmentees have already been mobilized from the 412th to support current operations in Iraq, Afghanistan, Kuwait, the Philippines, and the Balkans. Many of these engineers and technicians have civilian engineering jobs in government or industry, giving them a depth and range of experience not typically available within the Active Army.

The 412th staff capitalized on these individuals, forming a team with a wide range of technical abilities and demonstrated tactical proficiency. Almost all of the officers have engineering degrees and have civilian experience in the civil, mechanical, structural, electrical, environmental, and security engineering fields. The lead surveyor and designer had civilian survey and civil and mechanical design experience, the lead QA/QC individual had many years of commercial materials testing lab experience, and several of the technicians were construction contractors with knowledge of construction and drawings. Several experienced MOS 21H construction engineering supervisors provided additional depth to the team. The detachment commander served with the United States Army Corps of Engineers® (USACE) in the Gulf War as an Active Army engineer officer. Later joining USACE as a civilian civil engineer, he was responsible for USACE projects in South America and has years of engineering experience in areas torn by decades of guerilla warfare. He was also mobilized as a civil engineer for Operation Enduring Freedom in a previous detachment from the 412th and supported operations in northern Iraq and the Balkans.

However, the detachment commander realized that even this pool of talent was not going to be enough to be ready for the missions they would encounter. Many of the Soldiers identified for mobilization were sent to civilian and military training classes, ranging from reclassifying some of the enlisted as 21Ts to add to the technical workforce to training in improvised explosive device (IED) defeat, security engineering, safety, and contracting. Mobilization training at Camp Shelby, Mississippi, included base camp master planning and infrastructure assessment training from USACE, training on modern global positioning system (GPS) survey equipment, and other technical areas including required tactical training.

The 412th Soldiers linked up with the 130th in Kuwait in early October 2005. A few days later, the first teams were sent forward to Iraq to start the missions, and they maintained a rapid pace throughout the entire deployment. The 130th, with the 412th and other subordinate engineer units, assumed nationwide responsibility as the only corps-level engineering brigade.

Command and Control

Command and control was one of the first missions that the 412th started that was not a traditional CMS or DMS function. Since the FETs, the utility detachments, and the Air Force engineers were all working for the 130th, the

Photo by Major Clarence B. Kemper

Periodic technical reconnaissance allows Soldiers to track wear and tear on highways and helps predict future maintenance needs.

130th commander capitalized on the 412th's leadership and expertise to make Detachment 8 the central hub for corps-level technical engineers for the brigade. While Detachment 8 did not have formal command authority over these units, it took on many of the operational aspects of coordination, mission development, and supervision as needed on behalf of the brigade. The command and control assets were critical, particularly with units spread out all over Iraq. When working with these technical units, it was vital to have someone who both understood their world and was experienced in command and control. By "leaning forward in the foxhole," the 412th kept these assets engaged and plugged into future operations planning.

Integration

The 412th provided administrative support, cross-leveled expertise, and was task-organized for specific missions, while augmenting these units with design, engineering, survey, and QA/QC support as needed. The DMS not only developed its own designs but reviewed those for supporting units, providing additional design and engineering upon request. The brigade provided additional staff and resource support. However, for routine operations and technical work, the 412th assumed many of the duties normally falling to the brigade with respect to these units, leaving the brigade to concentrate on the line units and its missions. At the same time, the 412th assisted in intelligence analysis, operations, project tracking, mission development, and other tasks when additional expertise was needed. The detachment became fully integrated into brigade operations, while still maintaining a distinct mission set.

Infrastructure Assessment Missions

Assets were needed for future projects to go out and do the technical reconnaissance and then feed the results back for internal staffing. From that point, the CMS or DMS would develop a solution internally, reach back to USACE for additional support, or conclude that a given problem wasn't an issue that could be addressed at the corps engineer level. This was particularly true for infrastructure assessment missions. Some missions ranged over an extended distance, such as a 400-kilometer reconnaissance for developing estimates and scopes of work for road improvements. Other missions required working with the local Iraqi engineers for troubleshooting water systems and in building projects. Since these infrastructure assessment missions were "outside the wire," tactical proficiency was also required. During their deployment, the 412th found IEDs on job sites, were attacked by anti-Iraqi forces while on convoys and reconnaissance missions, and had mortars or rockets land near their work site or living area. Their ability to respond quickly and go anywhere at any time was cited as a key factor when compared to civilian employees and contractors who had comparable technical skills.

Paving Supply Routes

Some of the missions had been going on for several Operation Iraqi Freedom cycles, such as paving supply routes. These missions had technical, operational, and strategical issues, such as—

- Finding a source for quality paving materials.
- Planning construction around convoy staging requirements and multiple contractors.
- Shifting the availability of funds.
- Working with various Iraq ministries.

Paving supply routes not only affects coalition convoys but also civilian commerce, creating long-term impact on the rebuilding of Iraq.

Water System

The water pipeline from the Tigris River to the Qayyarah West (Q–West) Airfield provides water for many of the local communities. Attacks on the pipeline by anti-Iraqi forces not only interrupted water supplies to Q–West but also to the villages and towns in the region that had less storage capacity and were more vulnerable to a water stoppage. The 130th and the 412th partnered with Q–West units and local leaders to protect the water system as well as to upgrade pumps, relocate taps on the pipeline, and increase overall water production.

(Continued on page 38)

Military Designs:
Design to Time or to Standard?

By Second Lieutenant Carlos Flores

When providing designs in the Operation Iraqi Freedom theater of operations, two options must be considered as the main effort: whether to design to time or design to standard. Both of these options offer the constructing agent significant advantages; one or the other will be chosen, depending on the site and resources available. With increased military operations in Iraq and the reconstruction efforts, United States Army and Air Force civil engineers are faced with incredible logistic and support design challenges. When choosing which type of design will be suitable for a project, consider variables like time, funding, materials available, and human resources, as well as the experience of the troops executing the project. What exactly does *design to time* mean versus *design to standard*? The task of designing in a combat zone to support military operations in an ever-changing war zone requires design flexibility and improvisation. When combined with military operational tempo, this duo presents the battlefield designer with the question at hand: Should I design to time or to standard?

Design to Time

To put it simply, when a construction team designs to time, it presents a 90 percent design solution to the construction unit. The unit must then complete the design, adapting it to the challenges presented at the construction site. In past experience, custom designs have not reached a true sense of professionalism when referring to the end product given to the customer and the construction unit. However, this may not be a negative thing. Custom designs during an operation such as Iraqi Freedom are solutions to an operational need that is identified by a military unit or a customer. To understand the shortfalls of a particular military design, the following must be understood:

- The original intent
- The circumstances surrounding its development
- What the customer actually intends to solve

Designs in Operation Iraqi Freedom are not meant to be another addition to a residential living area or a commercial shopping mall; they are solutions to military operational needs. It is because of the flexibility and competence of American troops that our civil engineering effort in Iraq has made, and continues to make, an impact not only on the quality of life that American troops enjoy during their deployment but also on support to the development and reconstruction effort of a war-torn land.

The experience of the 130th Engineer Brigade's construction section with custom designs in Operation Iraqi Freedom is similar to other units. When a customer identifies a requirement for a project, such as a Southwest Asia (SWA) hut or a simple wall renovation, the designing unit provides guidance to the customer on what can be built based on the restrictions in the area. Sometimes, a customer wants special features in a project that will increase the difficulty of the construction project; however, through deliberate yet brief analysis, the designing unit can help guide the customer in making a better decision regarding the recommended design. The process of making a custom design begins when a unit is officially tasked to design a project—the equivalent of a civilian firm getting a contract. Each construction team must take into consideration that there won't be as many design options, meaning

Army engineers construct a road to facilitate access to a logisitics support area.

that there are fewer design teams deployed than there are civilian firms to choose from back in the United States.

One characteristic about custom designs in the Operation Iraqi Freedom area of operations is that it will likely continue to change until the project is completed. A design team is often pressed for time when a new design is started. This time constraint, although not unusual among military operations, isn't common in the civilian world. In many instances, the need for expedited results is addressed because of a serious short-fall that does not allow a unit to perform tasks that greatly affect their security or the well-being of Soldiers. Therefore, designs in Operation Iraqi Freedom have not evolved into a consummate set of construction drawings, but into a solution that, in many cases, results in a 70 percent solution.

A SWA hut nears completion.

Time and money have much to do with the degree of complexity of a design. For example, between the rainy months of January and March, flooding is a very serious issue for many installations and Army units in Iraq. Issues such as mobility and health are highly important in order to maintain combat readiness. Can a design team provide a full survey and go through the never-ending steps of proper design? The answer is no. A quick solution must be presented to preserve what little comfort and life support Soldiers have inside their living areas, since there is no other place for them to go to in Iraq.

Design teams from the Air Force and the Army have been challenged to bring these kinds of solutions to the battlefield. Sometimes personnel and equipment are not available, but through creative thinking, multiple obstacles are breached every day by civil engineering design teams in Iraq. Army engineers from the 84th Engineer Battalion constructed a road to provide access to a logistics support area so Iraqis could bring business and materials. The project is a good example of a quick solution, because it took only two and a half weeks from the time it was identified as a projected need to the time it was completed. The design work was much faster than normal and was complemented by sound engineering efforts during construction. If time had been a concern, the construction team would have been better off using a standard design.

Design to Standard

Standard designs are an effective way to provide almost instantaneous design solutions. However, designing to standard is very rare in Operation Iraqi Freedom because of the constraints and given the nature of the mission. Standard designs, although a quick way to get a design out to the customer, present other challenges, to include preparing the site to accommodate a standard design. While a design can be called standard, it will never be truly standard when constructed, because each site is different and presents challenges of its own. In order for a standard design to work properly, there must be communication between the design team and the builder. Additionally, the builder must be able to see implied tasks that come with the union of a standard design at a nonstandard site. In fact, many times the design has to evolve to fit into the site.

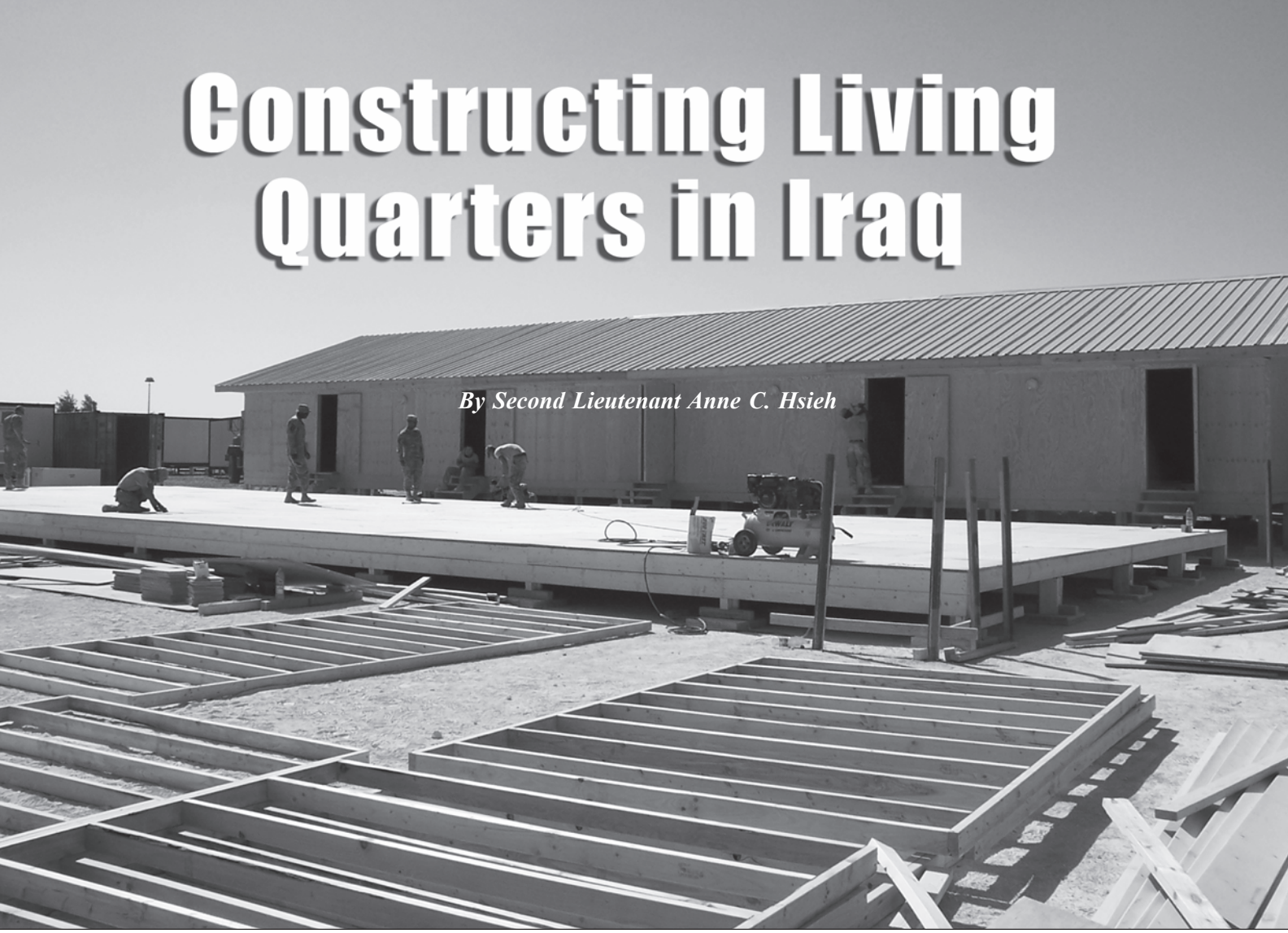
A good noncommissioned officer in charge (NCOIC) of construction is essential for executing a standard design. Although a standard design means faster design time, it could involve complications. But Soldiers and Airmen overcome these complications through communication and hard work.

Conclusion

Given an expedient design, U.S. Soldiers have had to improvise as they build. Design is not a simple task in Operation Iraqi Freedom; it requires a design team that is flexible, willing to commit, and able to overcome obstacles. Army units are constantly faced with challenges in Iraq; however, through the great work of engineering units and construction elements, they have achieved success in presenting a design solution that meets the needs of both the military and the civilians.

Second Lieutenant Flores is the S-3 assistant construction officer for the Multinational Corps–Iraq, 130th Engineer Brigade. His previous experience includes project manager in several engineering firms in the United States, design manager, chief designer in 52 architectural projects, and studio design instructor.

Constructing Living Quarters in Iraq



By Second Lieutenant Anne C. Hsieh

As the Multinational Corps–Iraq (MNC–I) continues to turn over military control to the Iraqis, small forward operating bases (FOBs) and combat outposts all over the country are shutting down and consolidating at a few main FOBs, one of which happens to be Al Asad Air Base. As a result, Al Asad needs to grow and develop to support the influx of personnel and units on base.

Soldiers from Alpha Company, 84th Engineer Battalion (Combat), worked on construction projects all over the base. Most recently, 1st Platoon was assigned to build living facilities called Southwest Asia (SWA) huts—based on the Southeast Asia (SEA) huts originally developed in Vietnam—for incoming personnel. From the start of the project in mid-April, the platoon met with a variety of challenges characteristic of any construction project in-theater: poor quality of materials, resource constraints, equipment breakdowns, and changes in plans. In addition, other missions sometimes took priority, pulling all personnel away from the project for weeks at a time. Nevertheless, the platoon has still managed to remain flexible and complete the project to standard. The platoon adapted to new issues as they arose, working late to compensate.

Prior to this project, 1st Platoon—also known as the "Rough Riders"—spent three months building the Iraqi army camp at Combat Outpost Rawah. Working with Navy construction battalions (Seabees), the platoon finished the project four weeks ahead of schedule. Upon its return to Al Asad, the platoon was assigned to various construction missions across post. The platoon transitioned away from the Navy Seabee construction system under which it had learned and worked during the first three months of deployment. Through the Al Asad project, the platoon discovered and refined the various strengths of its members and became a more cohesive unit.

More than 25 percent of the platoon is composed of combat engineers, most of whom never worked on construction projects before the deployment, much less directed construction crews. Their incorporation into the unit and performance in carpentry and electrical work was phenomenal. The platoon's combat engineers were given more construction responsibility at Al Asad, as opposed to the first project in Rawah, where they were an asset in tactics and force protection measures, and carpenters provided the technical skill and knowledge on the construction site. Combat engineer sergeants in the platoon even served as construction squad

Opposite page: The frame of an exterior wall of a SWA hut awaits completion of the floor.

Top: Soldiers from 1st Platoon work together to sheath the floor of a SWA hut.

Lower left: The completed SWA huts will provide comfortable living quarters for personnel at Al Asad Air Base, Iraq.

leaders for weeks at a time, manning their squads and leading by example on the jobsite every day. For the most recent living area construction project, two combat engineers directed and emplaced the entire roofing system for several of the large buildings. The experience of "carpenters and combat engineers joining forces" has been a challenging and worthwhile one. They learned to work together as one engineer unit despite different backgrounds.

They were indeed an incredible team. Even when there was only a few months left of deployment and dozens of construction missions looming on the horizon, the Soldiers of 1st Platoon, Alpha Company, 84th Engineer Battalion, continued to make a difference at Al Asad and Iraq—one SWA hut at a time.

Second Lieutenant Hsieh is the vertical construction platoon leader for 1st Platoon, Alpha Company, 84th Engineer Battalion (Combat). She is currently stationed at Al Asad Air Base, Iraq. She graduated from the United States Military Academy at West Point in 2005 with a double major in comparative politics and arts, philosophy, and literature.

Resourcing the Master Plan:

The 130th Engineer Brigade Class IV Story

By Captain Jeffrey M. Swartzlander

Engineers in Iraq have a huge job to do. One of the primary missions of the 130th Engineer Brigade was to support enduring base camp development and ensure that long-term bases grow and expand to accommodate the closure of dozens of small base camps throughout the country. As small operating bases close or are transferred to Iraqi army control, displaced coalition personnel and equipment move to an enduring base camp. In order to support all the construction driven by the base camp closure process or other support needs, Multinational Corps–Iraq (MNC–I) directed the 130th to maintain stocks of Class IV materials to support internal projects. The yard demands a great deal of effort to manage and maintain. However, nothing was quite as rewarding for the 130th S-4 section as running a thriving Class IV yard. This article outlines many of the tips, tricks, and systems that helped the yard flourish. Hopefully, some of the ideas presented will be useful to other engineers in-theater and to engineers who may have a similar responsibility one day.

The yard was only about seven months old when the 30th Engineer Brigade transferred authority to the 130th. During that period, the 30th S-4 section had built a very large and successfully operating Class IV yard. Millions of dollars spent during those seven months enabled four construction battalions to continuously build throughout Iraq, as well as advance unit basic load (UBL) stockage levels for the yard. When the 130th assumed control, its first priority was to continue developing internal and external systems and procedures where its predecessors left off.

Understanding the Process

To run a large Class IV yard, several systems must first be understood. Using the Joint Acquisition Review Board (JARB) and Joint Facilities Utilization Board (JFUB) processes, spend plans, purchase requests, contracting system, and military standard requisitioning and issue procedures (MILSTRIP) keep the yard stocked despite large and continuous outputs. An overview of these systems looks like this:

- *JARB:* An MNC–I board validates unit funding requirements costing more than $200,000. The 130th had an approved JARB packet that allowed funding requests to be forecasted on the spend plan, specifically to build and maintain a class IV basic load.
- *JFUB:* An MNC–I board validates and makes an approval recommendation for construction projects costing more

A pole barn—designed and built by the 130th Engineer Brigade—protects stocks of lumber, plywood, and cement from the elements.

than $200,000. Area support groups or major subordinate commands must secure the board's approval prior to securing project funding and commencing work on the project.

- *Spend Plan:* Units forecast and request all of their nonstock funding needs on a monthly financial report. Large requests (more than $200,000) must be previously validated by the JARB or JFUB.
- *Purchase Request:* The Department of the Army (DA) Form 3953, *Purchase Request and Commitment*, moves funding that was already forecasted and approved on the unit spend plan from resource management to the local contracting office.
- *Contracting:* A contracting officer uses funding committed on a purchase request to purchase supplies or services directly from a commercial source. For Class IV, this source is typically a local Iraqi company. Contracting is currently the major ordering method for ready-mix concrete and aggregate; electrical, plumbing, and hardware items; and any other commercially available products not readily available through MILSTRIP.
- *MILSTRIP:* This is the standard Army requisition system—separate from the above funding and contracting processes. Units requisition supplies through the Unit Level Logistics System (ULLS) or the forward distribution point (FDP) using a national stock number (NSN). MILSTRIP is the preferred and easiest procurement method. The 130th used this as the primary source for lumber and other types of construction materials.

Resourcing

Although the 130th operated and maintained a Class IV yard in support of brigade construction missions, the S-4 section didn't resource all projects due to limited personnel and resources. Guidelines were established for customer units that requested Class IV. Customers were normally expected to resource their own materials for projects, or at a minimum, obtain corps approval and funding for anything but minor projects. When possible, the 130th sourced the bill of materials (BOM) for projects from on-hand stock rather than delay a project for two or more months while the customer ordered the materials. The customer unit then furnished the 130th with the funded purchase request, and the 130th used the customer unit's funding to reorder and replenish the materials. In short, they sourced standard projects immediately with on-hand materials and replenished the depleted materials with future funding.

Obviously, only materials stocked in the yard could be provided. The customer is expected to source any nonstandard or accountable items for projects. Our S-4 section was not intended to be a substitute for other S-4s or relieve them of the responsibility of resourcing their units' needs.

When one of the 130th subordinate units was assigned a construction project, the constructing unit received a BOM from the design section of the 412th Engineer Command. Our construction unit completed a Class IV request router and submited it with the BOM to the brigade S-3 construction officer. The project was validated and assigned a mission tracking number. The router and BOM were staffed through the brigade S-4 delegate, and from there the BOM went to the Class IV noncommissioned officer in charge to prepare the materials for pickup. Once the materials were picked up, the BOM and request router were filed for material accountability. No materials left the yard without being accounted for.

Improving the Process

Improving routine ordering, which resulted in improved yard maintenance and control, was probably one of the largest contributions the 130th made to the operation of the Class IV yard. The brigade property book officer established a derivative unit identification code (UIC) and Department of Defense activity address code (DODAAC) strictly for Class IV yard use. Our ordering sergeant was able to place MILSTRIP requisitions at the FDP for expendable Class IV materials. The ordering sergeant also coordinated with the headquarters company ULLS–Ground clerk to order construction materials using the Class IX DODAAC. By continuing to research product NSNs and working the supply system, the yard was increasingly self-supportive and less dependent on competitive nonstock funds.

With regard to contracted orders, several hundred line items are available for order through easy-to-use blanket purchase agreements (BPAs) at the local contracting office. The BPAs enabled the S-4 ordering officer to place Class IV orders directly with vendors and simply maintain the declining funds balance. Quantities ordered were derived from a UBL shortage report from a computer database and an analysis of demand history.

Facing Challenges

One continued challenge is long and often unpredictable lead times in ordering supplies, with delivery of contracted orders arriving anywhere from one week to two months after the order was submitted. The same holds true for MILSTRIP orders—delivery from a matter of days to several months. Another common problem is material variants delivered by Iraqi vendors. Despite item photographs, illustrations, and descriptions in the contract, local vendors all too often provide incompatible, unwanted materials that must be returned. To mitigate this problem as much as possible, the S-4 ordering officer must be very clear and coordinate fully with the contracting officer and the vendor to ensure that the proper items are ordered and delivered. A final challenge to highlight is managing customer expectations. The yard principally exists to source brigade construction projects, while also serving as a reserve stockage for corps "be prepared" missions. As a general rule, the 130th did not source self-help projects on post, which can usually be resourced by the area support group's Directorate of Public Works self-help yard. Or the unit may order materials through the same MILSTRIP or contracting processes that the 130th used to order materials. The 130th resourced an outside unit if there was a legitimate need, if the project was validated and approved by the brigade

S-3 construction officer, and if the yard had sufficient materials on hand.

Conclusion

The Class IV yard came a long way since the 130th Engineer Brigade assumed control. It effectively and efficiently developed, managed, and improved the yard to proudly hand off to the next engineer brigade. The 130th Class IV yard truly "made a difference" in Iraq!

Captain Swartzlander is the S-4 in the 130th Engineer Brigade. His past assignments include survey platoon leader for the 320th Engineer Company (Topographic), executive officer for the 502d Engineer Company (MRB), and S-4 for the 565th Engineer Battalion. He is a graduate of the United States Military Academy.

Providing Class IV Support to the Iraqi Army

By Captain Jeffrey M. Swartzlander

Soldiers of the 130th Engineer Brigade contributed to the construction of a new Iraqi army base camp in Northern Iraq by issuing critical force protection materials to the Iraqi 1st Motorized Transportation Regiment (MTR). These high-priority materials were used to supplement force protection measures of the camp. Though this load-up was small, the brigade looked forward to future opportunities to assist the increasingly self-reliant Iraqi security forces.

For the past several months the Iraqi military forces have played an increasing role in maneuver operations to defeat terrorism. However, this transport mission executed by the Iraqi 1st MTR illustrated that the Iraqi army is becoming increasingly proficient at running its own logistical operations in addition to tactical operations. Although the convoy commander for this mission was an Army captain, it is only a matter of time before the Iraqi army is running its support and sustainment convoys autonomously.

The 130th maintained construction and barrier materials on-hand in its Class IV yard to supply theater construction projects. From on-hand materials, the 130th issued required supplies in a short time, allowing projects and mission construction or force protection missions to begin without delay.

Even though the convoy arrived a little behind schedule, the long-awaited force protection materials needed for the new Iraq forward operating base (FOB) were ready for issue. The 130th worked hand in hand with the Iraqi army, which shows a lot of dedication and enthusiasm as it continually moves closer to full self-reliance.

Captain Swartzlander is the S-4 in the 130th Engineer Brigade. His past assignments include survey platoon leader for the 320th Engineer Company (Topographic), executive officer for the 502d Engineer Company (MRB), and S-4 for the 565th Engineer Battalion. He is a graduate of the United States Military Academy.

("More Than Management," continued from page 31)

Similar civil-military missions included the evaluation of water treatment plants, sewage treatment plants, and buildings for local schools, often with subsequent design or other engineering support to improve those facilities.

Environmental Surveys

Environmental surveys are requirements for closing down any U.S. facility in Iraq, but there were no environmental survey teams available. This became critical to the corps-level mission of drawing down the coalition basing footprint. Under the leadership of a lieutenant colonel who is an environmental engineer with USACE as a civilian, several teams were trained in environmental standards, sampling equipment, and personal protective equipment. Through their efforts, a series of bases and facilities (including the Abu Ghraib prison) were closed or handed over to the Iraqis in a timely manner.

Quality Assurance/Quality Control

Alongside all of these other missions was the traditional CMS or DMS role of providing in-house design and managing troop construction. Designs included multistory, wooden buildings; concrete guard towers; building renovations; and roads and runways. Structural, civil, mechanical, electrical, environmental, and security engineering were integrated to create complete design-build packages for other units or contractors to execute. The QA/QC section worked with local concrete batch plants to improve the quality and consistency of the concrete by sharing expertise and conducting regular testing to ensure that the specifications were met. The QA/QC section also worked with units and contractors to ensure conformity of the plans and specifications or to work out variances, if required. Survey teams were sent out all over Iraq on missions that included performing 1,000-acre surveys and spot surveys to ensuring that new equipment was properly set and integrated into existing systems.

Conclusion

The 130th Engineer Brigade could not have accomplished these missions without Detachment 8, 412th ENCOM. Through its leadership and technical expertise—ranging from proactively assessing possible future projects (on and off post), supervising and assisting the FETs, and working with engineers of all services—Detachment 8 was a true force multiplier for the brigade and accomplished much more than just management.

Major Kemper is the structural, mechanical, and force protection engineer for Detachment 8. Commissioned in the United States Army Reserves, he has commanded a combat support equipment company and a mechanized combat engineer company. Since joining the 412th ENCOM in 2003, he has served in Germany, Italy, Korea, Vietnam, and Thailand. He is a registered professional engineer in Louisiana, Texas, and South Carolina and holds a mechanical engineering degree from Louisiana State University. In civilian life, he is a consulting engineer.

Winning Logistical Battles Together:

Civilian and Logistical Support in Operation Iraqi Freedom

By Captain Caprice Vargas

These days, civilians are not just on the battlefield; they are shaping it and contributing to the fight. In the maintenance and logistics world, the Army is relying heavily on contracted civilian support so it can focus more on the mission. This is great for the Soldier on the ground.

The 130th Engineer Brigade Maintenance Office was responsible for coordinating and communicating with these outside civilian agencies. If a unit is deploying to Iraq, especially as a part of a higher headquarters engineer element, the unit should prepare and train its Soldiers for the presence of these civilians on the battlefield. It is a lot like the civilian business world—the unit will have to make contacts, watch for upcoming fieldings and projects and, most of all, have a good rapport with the civilians.

Civilians on the Battlefield

On a daily basis, the 130th worked with civilian contractors employed by KBR, Inc. (formerly Kellogg, Brown, & Root); ManTech International Corporation; Caterpillar®; American Defense Systems, Inc. (ADSI); and L-3 Communications, as well as Department of the Army (DA) civilians.

KBR

KBR provides everything from maintenance support to transportation of parts and equipment. In addition to having military service units operate maintenance support shops, the Army hires contractors to enhance the capabilities of the units. In-theater, KBR contractors perform the duties of the supply support activity (SSA) and the direct support shop, under the guidance and direction of the assigned Army unit. Because they don't have a rank structure, there are slight differences in management, but the equipment is fixed and the parts are supplied nonetheless.

ManTech

ManTech supports many different types of equipment. The maintenance shop frequently interacts with this agency, attending meetings with ManTech contractors and project managers. ManTech works for the Product Manager, Assured Mobility Systems; together, the Army and ManTech have improved route clearance equipment. Although the ManTech shop isn't run like a military maintenance shop, similarities do exist, such as using a DA Form 5988-E, *Equipment Maintenance and Inspection Worksheet*, to open a job order.

A grader receives additional armor.

An up-armored D7 dozer is tested.

Caterpillar

Caterpillar handles many pieces of special engineer equipment that is not logistically supported by the Army system. A lot of engineer equipment is difficult to maintain, and parts are hard to acquire. So the maintenance shop relies on Caterpillar to provide mechanics for upper-level maintenance and parts. A blanket purchase agreement is used to buy hard-to-acquire parts for equipment such as dozers, scrapers, and graders. Once the parts arrive from the Caterpillar delivery system, their mechanics also install them. This operation is run similarly to ManTech.

ADSI and L-3 Communications

At Logistics Support Area (LSA) Anaconda, ADSI and L-3 Communications have made a joint effort to support engineers with special missions and special equipment needs. The Product Manager, Combat Engineer/Material Handling Equipment, hired ADSI. Civilians are in charge of the shop, and it runs well.

Parts Acquisition

The parts acquisition for the brigade was a huge challenge. Many civilians helped the 130th with parts acquisition and tracking. The DA civilians at the United States Army Tank-automotive and Armaments Command (TACOM) and the Defense Logistics Agency (DLA) helped track down parts through the Army system. Parts managers from Caterpillar and the AutoMAK General Trading and Contracting Company helped acquire critical parts for engineer equipment, including older equipment that is relevant to the mission but being phased out or replaced. These parts were generally shipped using civilian methods until they arrive in-theater, and then it became the unit's responsibility to transport the part on location.

Conclusion

Civilian and military personnel all have different missions in the Operation Iraqi Freedom theater. Without these agencies, vulnerabilities that could injure or kill Soldiers in action would exist. Our goal is one and the same: Win the war and keep our Soldiers safe.

Captain Vargas is the brigade maintenance officer for the 130th Engineer Brigade. Previous assignments include production platoon leader, 320th Engineer Company (Topographic); executive officer, Headquarters and Headquarters Detachment, 565th Engineer Battalion; and executive officer, Headquarters and Headquarters Company, 130th Engineer Brigade. She holds a degree from Illinois State University.

Photo by Staff Sergeant James Morris

Careful Planning Makes Safe and Rewarding Civil Affairs Missions

By Captain Brian J. Henderson

Any mission outside the confines of a forward operating base or logistics support area (LSA) has its hazards. Humanitarian and civil affairs missions are no exception. This was experienced when "Pioneer" Soldiers from Headquarters and Headquarters Company, 130th Engineer Brigade, had a mission to conduct an inspection of a small school near LSA Anaconda, Iraq, to determine the feasibility of making improvements.

The noncommissioned officer in charge (NCOIC) of the brigade commander's combat security team coordinated the mission. He wanted to make sure they planned for every contingency. He used aerial photography and current intelligence information to prepare his plan. Considerations included site security, rally points, partisan linkup, and battle drills for enemy contact such as improvised explosive devices (IEDs) or sniper fire.

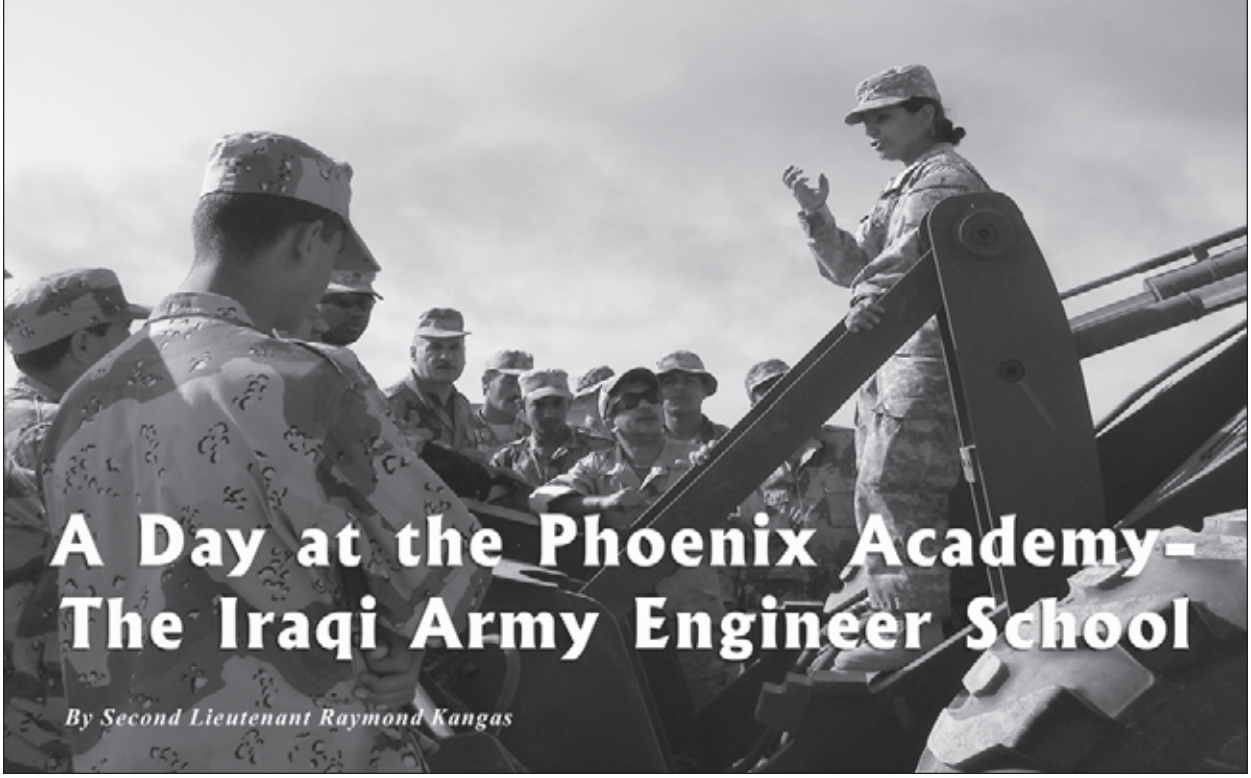
Meanwhile, the team conducted classes on using the M2 machine gun and rehearsed casualty evacuation (CASEVAC) procedures. Even though this was a humanitarian and civil affairs mission, the team needed to be prepared for emergencies. While the team members were highly trained in their battle drills, many of them from different military occupational specialties had not made it "outside the wire" yet. With a detailed operation order, rock drills, and rehearsals, all of the Soldiers involved felt confident in their mission.

When the team members arrived at the school that morning, they performed their battle drills flawlessly. Once their vehicles were in the designated sectors of fire to secure the site, the translator and the company commander linked up with the school headmaster. At this point, the Soldiers were able to dismount and greet the gathering crowd of children.

When the team inspected the school building, it discovered that there was no electricity or water. The headmaster expressed his interest in expanding the school and getting a reliable source of electricity. He said that the school's population would continue to grow and that the facility was needed for teaching all of the children.

When the inspection was completed, the Soldiers moved on to the humanitarian part of the mission. The children were given school supplies, toys, shoes, and food. Many of the gifts were collected from packages received by the Soldiers from friends and families back home. Additional gifts were provided by the 3d Corps Support Command (COSCOM), Assistant Chief of Staff, Civil Affairs (G-5) staff. The looks on the faces of the children made all of the preparation worthwhile. This mission was one more step toward the rebuilding of Iraq.

Captain Henderson is the commander of Headquarters and Headquarters Company, 130th Engineer Brigade. His previous assignments include S-3, 130th Engineer Brigade, Hanau, Germany. He is a graduate of the Airborne School, Engineer Captain's Career Course, Combined Arms Services and Staff School, Ranger School, and the North Atlantic Treaty Organization (NATO) Officers Course. He holds a bachelor's in environmental engineering from North Carolina State University.



A Day at the Phoenix Academy–The Iraqi Army Engineer School

By Second Lieutenant Raymond Kangas

One of the most rewarding experiences for a Soldier deployed to Iraq is to see the Iraqi people rebuilding their country and improving their way of life. On 1 April 2006, the Equipment Platoon, Headquarters and Support Company, 84th Engineer Battalion (Combat) (Heavy), had the unique opportunity to impact both of these goals by instructing Iraqi engineers on the operation of heavy engineer equipment. At the end of the day, the Americans and the Iraqis had learned a valuable lesson in engineering and team building.

Engineer forces are critical to the country of Iraq. As the Iraqi force grows and trains, it will acquire more responsibility for the reconstruction of its country's infrastructure and force protection measures and the basic mobility, countermobility, and survivability of combat engineer forces. The Iraqi engineers have built their fleet of equipment from various coalition forces. Now, the challenge is to train them on this equipment.

The Iraqi army has an excellent engineer training area located near Baghdad. With plenty of open space, scrap yards, and abandoned buildings, the Phoenix Academy at Camp Taji is the perfect setting for heavy engineer equipment training. The academy—also known as the Iraqi Army Engineer School—will grow and develop as a site for future Iraqi engineer soldiers to hone their operating skills. After graduating from the academy, the Iraqi engineers are assigned to their units to continue training and integrating with other military branches, develop their infrastructure, and create viable engineer units in the field.

The Equipment Platoon Soldiers helped the Iraqi army move closer to its goal by providing expert instruction on the engineer equipment. The platoon leader selected five noncommissioned officers, which included a staff sergeant with years of experience as a D7 dozer instructor at the United States Army Engineer School, Fort Leonard Wood, Missouri. For the one-day training session, each instructor prepared a 45-minute block of instruction covering the basic components, operating procedures, and operator maintenance of the D7 dozer, the 5-yard bucket loader, and the M917 20-ton dump truck.

During the morning session, the instructors watched as the Phoenix Academy cadre held formation and marched their soldiers to the training area. The Iraqis rotated to different pieces of equipment and listened as the instructors taught them the basics of each engineer asset. Interpreters were on-site to assist with communication. This verbal instruction period gave the Iraqis a chance to ask questions and receive an overview of the equipment's operation and capabilities.

During the afternoon session, the instructors organized "hands-on" instruction so that each student had an opportunity to operate the equipment. The instructors rode alongside the Iraqi soldiers as they operated the equipment for the first time. This enabled the instructors to point out techniques and capabilities of the machinery that was hard to communicate during the morning session. The American and Iraqi cadre conversed and took notice of the sense of accomplishment their soldiers displayed. It was evident they were excited to receive the equipment and instruction and step closer to their goal of self-sustainability.

The Equipment Platoon not only successfully completed its mission to train the Iraqi engineers but also walked away with a better understanding of what a great challenge it is to rebuild a country. The experience was a cultural exchange between nations rather than merely a block of instruction. The Equipment Platoon's experience and interaction at the Phoenix Academy created a more solidified engineer team between the 84th Engineer Battalion and the future Iraqi engineer force.

Second Lieutenant Kangas is the heavy equipment platoon leader for Headquarters and Support Company, 84th Engineer Battalion. He holds a bachelor's in business from Kennesaw State University in Atlanta, Georgia.

130th Engineer Brigade: HOT and MAD in Iraq

Photo by Jimmy Lane Jr.

By First Lieutenant Sarah E. McMahon

The 130th Engineer Brigade was HOT (*Helping Our Troops*) and MAD (*Making a Difference*) in Iraq. During Operation Iraqi Freedom (OIF) 05-07, members of the 130th cleared improvised explosive devices (IEDs), filled potholes, provided electrical power, and built living quarters across the Iraqi province. As the brigade commander said from the beginning, "*Make the days count, don't count the days.*" The brigade's deployment to Iraq has now ended, but everyone worked hard to make sure that the efforts and time put in would leave a mark that would last until long after American forces are home.

Working on the 130th Engineer Brigade staff opened the eyes of this junior officer. At a platoon, company, or even battalion level, the big picture can often be overlooked. But after working on the theater corps engineer brigade staff, a whole new world was brought to light about all the great things Soldiers everywhere are doing in Iraq. The main focus of OIF 05-07 was on rebuilding and transitioning power to the Iraqis, a piece of the puzzle that the 130th played a large part in. Members of the 46th Engineer Battalion, the 913th Combat Support Equipment Company, the 412th Engineer Command, and the 84th Engineer Battalion worked diligently through the blazing heat to rebuild their areas of operation. Whether it was repairing roads, opening river crossings, or building living quarters to improve quality of life, these units were the key to success for all missions.

Not to be outdone, the 54th Engineer Battalion and the 110th Engineer Battalion spent their days in Iraq making the roads safe for military convoys and civilians alike by clearing IEDs—one of the deadliest hazards of the war. Each day, those Soldiers put their lives on the line for the mission and wouldn't quit until their time in country was done. Put in situations that would make most people shy away, these Soldiers boldly took on their mission and raised the bar of excellence for future operations in their field.

OIF 05-07 had its hardships, because many of the battalions experienced loss. Soldiers were wounded and left the theater to return home, and others paid the ultimate sacrifice for their country. It is the memories of those brothers and sisters the brigade lost that drove the remaining Soldiers to strive harder for excellence and never let up, honoring the memory of their fallen comrades. It is never easy to say goodbye, but their sacrifices will not be in vain.

Overall, the brigade's time in Iraq was a huge success, and the Soldiers went home holding their heads high—proud of what they accomplished. Whether working on a brigade staff or working as part of a team in a platoon, each Soldier played an important role in the success of the 130th Engineer Brigade during OIF 05-07. The articles on the preceding pages (4 – 42) tell their stories and the part they played in the reconstruction of Iraq and the Global War on Terrorism.

First Lieutenant McMahon was the Assistant S-1 of the 130th Engineer Brigade. Her previous assignment was as Headquarters Platoon Leader of the 320th Engineer Company (Topographic). She holds a degree from the University of Notre Dame.

Brigade Special Troops Battalions

Part I: All the Way In

By Lieutenant Colonel Thomas H. Magness

Consider the case of the brigade special troops battalion (BSTB). There is no approved doctrine and no distinct approach to growing a leader for its ranks. No single branch currently owns it nor populates its leadership roles. Across the Army, it is considered a collection of "specialists" with no clear task and purpose—a battalion in search of a mission and a meaningful role within the brigade combat team (BCT). Few understand it. Fewer still have seen what happens when you unlock the vast potential that resides within the assemblage of this seemingly unrelated group of maneuver supporters.

Simply put…you must be "all the way in." To really "get" the BSTB, you must fully embrace transformation and the new paradigms associated with the Army redesign. You cannot just dip your little toe in the water—you have to take off the harnesses, shed completely the old way of doing business, and fully immerse in the transformation "pool." Doing so reveals this battalion as a truly powerful enabler of maneuver, *synchronizing* and *synergizing* effects across the brigade's area of operations (AO), and *delivering* for its respective BCT in ways that are orders of magnitude greater than what was possible without it. More importantly, the BSTB is a battle-tested battalion that exists to address some of our most challenging combat missions, to include execution of intelligence and communications functions, assured mobility, reconstruction and essential services project management, and military police operations. It is a battalion whose success is directly linked to the success of its supported brigade. It is a battalion whose every leader and every Soldier had better, themselves, be all the way in.

What follows, then, is a collection of findings and observations that describe what "all the way in" might look like. It is a combination of lessons learned at the National Training Center and regular dialogue with BSTB commanders and leaders in various stages of the deployment cycle. This article reflects the growing body of knowledge and understanding about the capability of this powerful organization and the new operational paradigm that must exist to fully leverage it. Finally, I believe it reflects the vision of our Army leadership in creating modular, capabilities-based units that are able to fight and win on a full-spectrum battlefield. But to understand this vision…you *must* be all the way in!

Background

The decision to create a new BSTB was made after several…observations of the newly fielded Stryker brigade combat team (SBCT) revealed a need to bring the many separate, enabling combat support units under the control of one commander. The span of control in the SBCT organizational design proved to be too extensive for effective C2 [command and control]of these many enabling eaches. The BSTB organizational design allows the BCT commander…to concentrate [his] focus on the battle in all threat environments, without the added direct responsibilities that these small units require.[1]

The Army recognized a challenge in its modular design with respect to the command and control of small (company and below) maneuver support units. The brigade commander needs to focus on fighting his respective battalions. The brigade staff identifies subordinate unit tasks, the completion of which will enable the accomplishment of the commander's intent, while synchronizing and resourcing subordinate battalions for success. A brigade commander and his staff simply are not resourced—and frankly do not have the time or energy—to command and control, let alone resource, prepare, train, or provide administrative oversight to these disparate units, dozens of which may be present within a deployed BCT formation.

The nearly 40 BSTBs in the Army exist to help solve this problem. BSTBs *command* and *control* attached and organic units—period. They execute the tasks assigned to them. They leverage the full "team of teams" to accomplish the mission according to the BCT commander's intent. They receive the tasks assigned to them by the brigade, translate the tasks into synchronized mission orders, and complete them in a way that adds value to the brigade.

What kind of missions? Generally the BSTB executes missions that extend across the BCT AO. These are missions that exceed the geographic boundaries of a maneuver task force and for which oversight and command and control responsibilities reside at the brigade level (i.e., the BSTB). These missions might include intelligence and communication operations, route reconnaissance and clearance, civil affairs missions, or essential services management—the execution of which generally requires the crossing of task force

boundaries and often reaches across the full width and depth of the BCT AO.

> *Command*: The authority and responsibility for effectively using available resources for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions.
>
> *Control*: The regulation of forces and other battlefield operating systems to accomplish the mission in accordance with the commander's intent.
>
> FM 1-02, *Operational Terms and Graphics*

The New Paradigm

There is a new way of doing business, a new paradigm, consistent with being all the way in. Tasks that were formerly assigned directly by the BCT to each of its small maneuver support units are now formally assigned to the higher headquarters uniquely responsible for the execution of those tasks—the BSTB. All tasks are assigned by the brigade commander (through the S-3) to the BSTB. It is the responsibility of the BSTB to determine how best to leverage its specialized units to accomplish the mission and meet the commander's intent.

Implicit within this new paradigm is the understanding that commanders and specialized unit leaders do not "work for" staff officers. Gone are the stovepipes and shortcuts whereby BCT staff officers reach down into these small units and issue "fire missions." Staff officers assign tasks to the BSTB. The BSTB commander and his staff translate these tasks into fully planned, synchronized, and resourced missions—**and are held accountable for mission accomplishment!**

Resistance to this new paradigm (What new organization or design does not come without its naysayers?) comes in two forms: The first is the concern that the BSTB introduces an additional layer of bureaucracy between specialized units and the brigade staffs assigning them tasks. On the contrary, the BSTB exists to translate the tasks into simple, executable mission orders while resourcing subordinates for success. More importantly, the BSTB implements necessary measures to prepare units to execute all tasks beyond the traditional capability of staff elements—and then monitors their completion. This concern is further alleviated by BSTB commanders who leverage warning orders, provide dedicated liaison officers, and encourage cross talk between staff sections (brigade – battalion) and between brigade staff elements and the specialized units under their command.

The second resistance to this new approach is from those who feel that the old way was working fine, negating the need for change. (They are **not** all the way in!) What they cannot possibly know (until they see it in action) is…compared to what? Compared to the deliverables possible when a *battalion*, with all of its resources, is put on the mission for which we used to ask a staff section at one or two persons deep? Not even close. Compared to the synergy possible when a *battalion*, all the way in, focuses all of its resources on the planning, preparation, and execution of tasks to meet the brigade commander's intent? It is an order of magnitude difference.

BSTB Doctrinal Key Tasks

Key to accepting the premises implicit within the new paradigm is an understanding of the doctrinal tasks and functions now provided by the BSTB. These are the value-added functions that must be routinely provided to address the problems associated with the command and control of small units. They are among the limiting factors that prevent staff officers from being able to do more than assign tasks, and the type of deliverable for which the BSTB is now responsible. They are the critical details that are often the difference between good…and great.

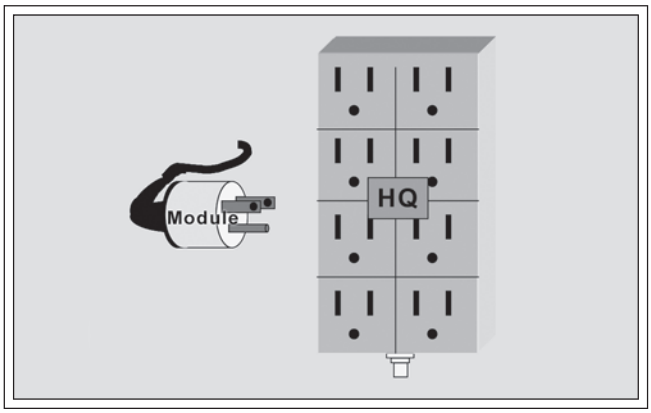
- *Exercise command and control over BSTB units during the preparation and execution of BCT-directed missions.* BSTB commanders are held accountable for both.
- *Ensure that BSTB commanders and leaders conduct precombat inspections and rehearsals focused on the execution of assigned BCT tasks.* Think about this: Who performed these roles for small units before their assignment to the BSTB?

> The BSTB is an integral component of the modularized BCT. I rely on them every day to lead my low-density unique units and keep their specialized equipment operational.
>
> BCT Commander, 3d Infantry Division

- *Ensure that BSTB unit assets are positioned to execute their assigned tasks.* For the sake of clarification, this requirement is neither to determine the tasks nor to determine the required positioning. Those tasks are accomplished at the brigade staff level. Consistent with the new paradigm, the BSTB ensures that the tasks are accomplished in order to meet the BCT commander's intent.
- *Coordinate to ensure that combat service support, force health protection, and security are provided for BSTB organic and attached units positioned throughout the BCT AO.* The BSTB does not have the capability to resource every one of its subordinate units across the width and depth of the BCT AO. Its mission is to coordinate resources and, when required, to provide the resources themselves.
- *Coordinate or provide security for organic and attached units moving throughout the BCT AO.*[2] Small units cannot generally secure themselves. The BSTB is responsible for coordinating security through the supported unit or, if

required, providing the security itself. It's no surprise—there are no "security units" within the BSTB. The combined resources in the team of teams must work together to provide necessary security assets.

A critical function woven throughout each of these tasks is the requirement of the BSTB to capably address attachments and detachments. The capacity of the brigade to receive modules is directly related to the ability of the BSTB to serve as the "socket" for the incorporation of any number, form, and function of modular "plugs." The BSTB must have adequate standing operating procedures (SOPs) to address the receipt of attachments—to include logistical, administrative, and tactical issues—in order to facilitate their rapid integration into BCT operations.



The final doctrinal role for the BSTB is perhaps the one upon which most BCT commanders rely—*perform roles as dictated by the BCT commander.* These are generally the missions that cross task force boundaries and extend across the full reach of the brigade's AO. Note the heavy *maneuver support* focus in these missions. They include (but are certainly not limited to) the following:

- *Command and control of detainee operations*. Current Army doctrine on detainee operations highlights the criticality of "green tab" leaders at every echelon of detention. BCTs often leverage the BSTB as a natural fit for this role. Who better than the higher headquarters for military police (detainee proponents) and military intelligence (interrogation experts) (i.e., the BSTB) to effectively oversee this vital mission?
- *Forward operating base (FOB) defense*. BSTBs either receive augmentation forces or coordinate between tenant units to provide all elements of base defense, command and control, and life support. This is a "current fight" extension of the rear area headquarters mission envisioned for this battalion during its original design. This critical mission must be planned, resourced, rehearsed, and executed incorporating all elements of base defense.
- *Route reconnaissance and clearance/assured mobility command and control*. BSTBs leverage the unique capabilities of subordinate military intelligence, military police, engineer, and explosive ordnance disposal units to address threats to mobility such as improvised explosive devices (IEDs). This is clearly one of those "cross-boundary" issues in which the synergy of putting all enablers under one common headquarters (assigned the mission and provided with the resources) can have powerful results.
- *Reconstruction headquarters and essential services project management.* BCTs routinely rely on the BSTB (reorganized at the staff level for this mission) to provide oversight for critical infrastructure repairs. Not surprisingly, this mission often becomes the BSTB main effort and ties directly to most of the BCT operational priorities.

In-Theater Validation

BCT commanders continue to rely on their BSTB commanders for some of the brigade's most critical functions. In a recent, informal query of fourteen BSTB commanders, only three responded with battalion missions (specified or implied) that read anything like "force provider." Most common among the respondents was service in the mission areas of base defense (8/14); detainee operations (8/14); and reconstruction/essential services (11/14). Interestingly, rather than force provider, BSTB units are assuming the form and/or function as "nonlethal effects task force," "maneuver support task force," "combined arms effects battalion," and "nonlethal fires battalion." True combat multipliers and value added, indeed.

> The BSTB command team not only executed millions of dollars worth of reconstruction but also aggressively worked with media to get the message out. They offered me a headquarters that could focus on an area that influenced millions of people and influenced the core of the insurgency. They were an invaluable asset to this combat brigade. I wouldn't leave home without them.
>
> BCT commander, 3d Infantry Division

Deployed commanders find that there is simply too much to do and too many critical functions that cross task force boundaries without the synchronization of effects made possible through the BSTB. The stakes are too high to ask small, over-tasked, brigade-level staff sections to *command and control* subordinate units. Successful execution is made possible by putting a battalion headquarters (a BSTB) on those things that require battalion-level resources and effort. Mission accomplishment and the best practices in-theater point to the value added, many times exponentially, of this approach.

Parting Shots

Some mistakenly view the BSTB as a large headquarters company, a force provider of trained and resourced specialized units back to the brigade for tasking and

employment. Listen…the Army does not centrally select battalion-level commanders and command sergeants major for those kinds of roles. And with a war going on…it certainly does not need them. That type of approach is not grounded in either combat training center or theater lessons learned and reverts back to the problem that Army leaders felt existed when they created the BSTB! This is a unit designed to "command and control attached and organic units" for missions that reach across the BCT AO.

One word appears repeatedly in any discussion about the BSTB: *execution*. The combining of units under a common headquarters must translate into results. The new paradigm must, in fact, be better. Separate units that were previously unfocused, unsynchronized, poorly resourced, and challenged during execution must now deliver. Simply put, the BSTB—like any other battalion—must accomplish its assigned missions.

Successful execution is made possible through leaders who create synergy. (See note at right.) The combination of maneuver support units that seemingly have nothing to do with each other (military intelligence, signal, military police, engineer, explosive ordnance disposal, civil affairs, chemical) must produce a total that is greater than the sum of its parts. Mathematically: 1+1+1>3. The bulk of the missions provided by BSTBs (reconstruction, assured mobility, detainee operations) are made possible by units that think outside of themselves, that knock down old stovepipes, and that work together for the common good. This is only made possible through branch-immaterial, selfless, team-centric thought and action. That is what being "all the way in" is really all about.

Lieutenant Colonel Magness is an Army War College fellow at the University of Texas. Previously he served as an observer-controller at the National Training Center (NTC) at Fort Irwin, California.

The views expressed in this article are those of the author and do not necessarily reflect the official policy or positions of the Army, the Department of Defense, or the U.S. government.

Endnotes

[1] Field Manual Interim (FMI) 3-90.61, *Brigade Troops Battalion Operations*. March 2005.

[2] Ibid.

Note: "Brigade Special Troops Battalions, Part II: Synergy" will be published in the October-December 2006 issue of *Engineer.*

Dedication

The following members of the Engineer Regiment have been lost in the Global War on Terrorism since the last issue of *Engineer*. We dedicate this issue to them.

Sergeant Carlton A. Clark	2d Brigade Troop Battalion, 2d Brigade Combat Team	Fort Campbell, Kentucky
Staff Sergeant Stephen A. Seale	2d Brigade Troop Battalion, 2d Brigade Combat Team	Fort Campbell, Kentucky
Corporal Jose Zamora	2d Brigade Troop Battalion, 2d Brigade Combat Team	Fort Campbell, Kentucky
Sergeant Jason J. Buzzard	8th Infantry Regiment, 2d Brigade Combat Team	Fort Hood, Texas
Sergeant Ian T. Sanchez	32d Infantry Regiment, 3d Brigade Combat Team	Fort Drum, New York
First Sergeant Christopher C. Rafferty	Charlie Company, 37th Engineer Battalion	Fort Bragg, North Carolina
Corporal Ryan J. Clark	40th Engineer Battalion, 1st Brigade Combat Team	Baumholder, Germany
Specialist Robert L. Jones	40th Engineer Battalion, 1st Brigade Combat Team	Baumholder, Germany
Sergeant Reyes Ramirez	40th Engineer Battalion, 1st Brigade Combat Team	Baumholder, Germany
Corporal Andy D. Anderson	Bravo Company, 46th Engineer Battalion	Fort Rucker, Alabama
Sergeant Carlos E. Pernell	Bravo Company, 46th Engineer Battalion	Fort Rucker, Alabama
Specialist Troy C. Linden	54th Engineer Battalion, 130th Engineer Brigade	Bamberg, Germany
Specialist Joseph P. Micks	54th Engineer Battalion, 130th Engineer Brigade	Bamberg, Germany
Staff Sergeant Omar D. Flores	54th Engineer Battalion, 130th Engineer Brigade	Bamberg, Germany
Sergeant Sirlou C. Cuaresma	62d Engineer Battalion, 13th Containment Command	Fort Hood, Texas
Sergeant James P. Muldoon	68th Combined Arms Regiment, 3d Heavy Brigade Combat Team	Fort Carson, Colorado
Captain Patrick D. Damon	Headquarters & Headquarters Company, 240th Engineer Group	Augusta, Maine
Sergeant Leroy Segura, Jr.	362d Engineer Company, 54th Engineer Battalion	Fort Benning, Georgia
Sergeant Bryan C. Luckey	562d Engineer Company, 172d Stryker Brigade Combat Team	Fort Wainwright, Alaska
Sergeant Dustin D. Laird	913th Engineer Company, 46th Engineer Battalion	Union City, Tennessee

Army Engineer Divers in the Fight

By First Lieutenant Thomas Darrow

The most common response Army divers hear when explaining their profession—no matter what they are doing or where they are in the world—is "I didn't know the Army had divers." Although Army divers have been in the fight since the beginning of Operation Iraqi Freedom, this response is still heard today in Iraq, Kuwait, and the rest of the United States Central Command (CENTCOM) area of responsibility. The 74th Engineer Team (Dive) and the 544th Engineer Team (Dive) were deployed to serve during the invasion of Iraq in March 2003, and their missions primarily consisted of conducting river reconnaissance, mine clearance, bridge demolition, hydrographic surveys, weapons of mass destruction (WMD) searches, and personnel recovery (see "Army Diver Missions in Iraq," *Engineer,* July-September 2003, page 28.) After completing five months of service, the 544th was sent home, but in December 2005, was again deployed to support Operation Iraqi Freedom. The unit conducted its relief in place (RIP)/transfer of authority (TOA) with the 511th Engineer Team (Dive). Currently, the 544th falls under the Coalition Forces Land Component Command (CFLCC) C-7 (engineer staff section) and Area Support Group–Kuwait (ASG–KU). Although some missions have changed over the past few years, many remain the same.

Scope of Work

The presence and usefulness of the Army diver is historically lost in the constant changing of the guard within CFLCC and Multinational Corps–Iraq (MNC–I). It has become customary for the dive team commander to conduct briefings for the combatant commander and high-ranking officials in Kuwait, Iraq, and Bahrain for CFLCC, MNC–I, and the United States Naval Forces Central Command (NAVCENT) on the Army engineer diver mission and their broad scope of work.

Security Swims

One mission consisted of assisting a Navy explosive ordnance disposal (EOD) unit with antiterrorism force protection (ATFP) security swims at shipping ports within the CENTCOM area of responsibility. To date, the 544th has conducted more than 30 ATFP security swims. The team works with local officials to assist in the port security mission, which usually involves the help of the Navy Criminal Investigation Service (NCIS) and local medical support. The major customer of the ATFP security swims is the Army watercraft team. The watercrafts maneuver throughout the CENTCOM area of responsibility, providing necessary resupply items.

Since the watercraft team is well aware of the usefulness of Army divers, it takes full advantage of the other benefits the dive team has to offer. In addition to conducting hull surveys and clearing screw propellers, the 544th has cleaned the bottom of vessels maintained by the United States Army Materiel Command (AMC). These vessels are part of the pre-positioned stock of Army watercraft maintained by AMC. The divers have also recovered ammunition, weapon parts, and personal equipment dropped over the side of vessels while in port.

Personnel Recovery

The 544th was also called on for one of the more unfortunate, but honorable, missions an Army diver can accomplish: the recovery of a fallen service member. While planning another mission, an inquiry was received about the usefulness of the Army diver in personnel recovery. Two days later, the team was sent to assist with the recovery of two missing Marines. A troop carrier with nine Marines aboard had flipped over in a river, and two of them had not been recovered. Over an 8-day period, the team diligently searched a 20-kilometer stretch of the river extending from the crash site to the mouth of the Euphrates River. The team located a 50-caliber machine gun, an M16 rifle, an M9 pistol, and multiple 50-caliber machine gun rounds lost in the accident. In keeping with the Army diver tradition, the team did not leave the site until the missing personnel were recovered. Local Iraqi civilians discovered the Marines 70 kilometers downstream from the accident site and turned the bodies over to coalition forces.

Reconnaissance

After returning from that mission, the team was requested for a reconnaissance mission on a flooded basement that was scheduled for renovation. The basement had been mysteriously flooded since 2003, and no one knew why. British forces requested outside diving support for the dive team. Due to the uncertainty of the building's condition, the 544th deployed its remotely operated vehicle and viewed the basement from the safety of the building's driest floor.

During the mission, the 544th was needed for the emergency recovery of a downed Hunter unmanned aerial vehicle (UAV). For unknown reasons, the UAV plummeted into a small lake, and its recovery was necessary to investigate the cause of the vehicle's malfunction. A four-man team successfully recovered all the parts of the UAV. With the deployment of the four-man team, the detachment spread out and worked on separate tasks. Army engineer dive teams are designed by their very nature to be separately employed autonomously of each other, a feat the 544th has successfully accomplished several times since being deployed to Iraq.

Opposite page: Members of the 544th Engineer Team (Dive) recover a 50-caliber machine gun that was found during a search for missing personnel.

Above: A Soldier conducts a welding operation on a metal ramp.

A diver prepares to cut a rudder on a tugboat.

Salvage

During the recovery mission, a request was received to conduct a reconnaissance and salvage of an Iraqi float bridge. The team focused on this task after completing the recovery mission. Destroyed by coalition forces, the bridge needed to be removed from the water so locals could cross the river in small boats as part of their everyday lives. The team decided to send two separate elements. The first team conducted a reconnaissance of the project site, and the second team brought additional equipment and personnel needed to complete the task. After the first team arrived, it was redirected to conduct a personnel recovery from a helicopter crash elsewhere. The team quickly moved to the crash site, deployed side scan sonar equipment to locate the helicopter, and then conducted diving operations around the clock until they recovered the remains of the two helicopter pilots. The other team members sent additional manpower and equipment to help recover the helicopter. After the successful completion of the mission, the team proceeded to work on the reconnaissance and salvage of the Iraqi float bridge.

Other Missions

In addition, the 544th has worked in Kuwait to accomplish other valuable missions. The team conducted an inspection and repair mission of a security system on an oil platform. Future missions at oil platforms have already been developed for later in the year to increase security and improve the quality of life for the Sailors stationed there.

Other missions included joint work with and for the Kuwait navy. The dive team spent 30 days conducting underwater cutting operations on two old Iraqi tugboats that the Kuwaiti navy used for target practice. In order to scrap the tugs, the propulsion system needed to be cut off the bottom of each of the tugboats. Once the team cut the propulsion system, using their underwater cutting equipment, the tugboats were beached and scrapped. They also welded a ramp extension together so a Kuwaiti unit could board its vehicles on Army watercraft to conduct a mission. The Kuwaiti vehicles did not have enough clearance and needed a little lift to prevent damage.

Diver Qualification Process

In spite of such a busy schedule, the team managed to squeeze in a deep diving exercise the first week in March that allowed them to qualify some of its newly dubbed First Class Divers. After promotion to staff sergeant, a diver attends First Class Diver School in Panama City Beach, Florida, at the Naval Diving and Salvage Training Center (NDSTC). After completing the course, the First Class Diver undergoes an extremely intense qualification process to earn the title of being a qualified diving supervisor and capable of operating on his own. These qualifications and corresponding acquired skills are the backbone of the Army diving community. Becoming qualified allows diving supervisors to be deployed independently to any location in the world to conduct diving operations. As an example of the skill and competence of these staff sergeants, the majority of these missions were completed or supervised by staff sergeants operating independently.

No Job Too Large

The Army diving community is small, and the current presence in-theater is even smaller, but as Army engineer divers of the past have shown, and as the 544th continues to demonstrate during its current deployment, no job is too large. Eventually, the combatant commander will no longer be surprised that Army divers exist, but rather be aware of the benefits they offer and seek out those skills.

First Lieutenant Darrow is assigned to Third Army, Area Support Group–Kuwait, while deployed in support of Operation Iraqi Freedom. He was previously assigned to 7th Transportation Group (Composite), 6th Transportation Battalion, United States Army Dive Company (Provisional), Fort Eustis, Virginia. He is a graduate of the Engineer Officer Basic Course, the Diver Course Phase 1, the Sapper Leader Course, the Diving Basic Officer Course, and the Salvage Officer Course. He holds a bachelor's in business management from Providence College, Providence, Rhode Island.

Explosive Hazards Coordination Cell Mobile Observation Teams

By First Lieutenant Phillip M. Smith

Engineers are performing a major role in defeating the increased threat of deadly improvised explosive devices (IEDs) in Iraq. Their role in the counter-IED fight is to protect military convoys and the Iraqi population by searching for and removing IEDs from the roadways. The engineers work in teams, which are proudly known as *IED Hunters*, as they perform their duties with courage and honor at the risk of losing their own lives. According to statistics from June 2006, route clearance teams account for a significant portion of all IED finds in Iraq.

Explosive Hazards Coordination Cell

In the fall of 2005, officers and Soldiers from the 115th Engineer Battalion were mobilized as the Explosive Hazards Coordination Cell (EHCC)—formerly known as the Mine and Explosive Ordnance Information Coordination Cell (MEOICC)—to support Operation Iraqi Freedom. One of the primary missions of the EHCC is engineer route clearance.

Mobile Observation Teams

In January 2006, the EHCC organized mobile observation teams (MOTs) to help in the counter-IED fight. The MOTs monitor the progress of route clearance teams at the corps level. Their mission is to observe, collect, write, publish, and distribute route clearance information. One of the ways they do this is by observing the best tactics, techniques, and procedures of the route clearance teams and then disseminating this information to the other teams through regularly scheduled conferences. This process of collecting and distributing information captures lessons learned and empowers the teams to be more effective.

The MOTs travel throughout Iraq to meet with and observe all route clearance teams. These visits can last up to several days, depending on the number of teams per engineer company. The MOTs accompany the route clearance teams on their combat missions as specialized observers. Working with the team in this manner—and with a similar mission to

These mine-protected vehicles, the Buffalo and the RG-31, are used in the counter-IED fight.

The robotic arm of the Buffalo searches for suspected IEDs.

defeat IEDs—creates a bond between the MOTs and the route clearance teams that strengthens both groups. The MOTs learn from each team because of the difference in leadership, equipment, and geographical areas in which the teams operate. During the missions, the MOTs ask a variety of questions to the vehicle crews (driver, vehicle commander, and gunner) while they are searching for IEDs. This allows the MOTs to analyze and build on the team's strengths and correct identified weaknesses.

The MOTs share the broader perspective of route clearance operations with route clearance commanders and their teams, as well as the latest information on new equipment that is available and how it will be used. They also share their perspectives on problems pertaining to route clearance operations that are not seen at the corps level. Major issues are thereby streamlined and fixed on a mass scale to the benefit of all route clearance teams.

At the conclusion of each visit, the MOTs outbrief the company commander on his team's performance. The briefing generates an official report that is given to his chain of command. Commanders at all levels have welcomed these visits and the assessments of their teams. The MOTs' assessments then are compiled and distributed through briefings or e-mail messages to all of the route clearance community.

Route Clearance Handbook

In April 2006, the MOTs published an unclassified Route Clearance Handbook that provides guidance to route clearance teams and captures the continuity of experience to help train new teams. The handbook is updated monthly with the latest assessments and then redistributed to the coalition forces, the combat training centers, and the United States Army Engineer School. A quote from the handbook says:

"This handbook is designed for a platoon-level route clearance team. A new patrol leader to route clearance will be able to read and understand current tactics, techniques, and procedures and how to employ route clearance vehicles."

Upcoming Products

The MOTs are scheduled to publish a Leaders Operational Handbook in the fall. They are also helping create the doctrine that will be trained to the new Iraqi army route clearance teams. Engineers continue to battle the IED fight through route clearance operations, but it has not been without the loss of great Soldiers. Engineers will continue to *Clear the Way*.

First Lieutenant Smith commands the Headquarters Detachment, 115th Engineer Battalion, and is the leading officer in charge of the MOTs. A prior enlisted Soldier, he has served almost 11 years in the Army National Guard. He is a graduate of the Engineer Officer Basic Course and will soon attend the Engineer Officer Advanced Course. He also holds a liberal arts degree from Frostburg State University, Frostburg, Maryland, with a minor in computer science. Lieutenant Smith is a New Mexico State Police Officer when not called to active duty.

Photo by Milton N. Ricks, Project Engineer, USACE

Dam Restoration Keeps Military Moving Forward

By Dr. JoAnne Castagna

Since 1802, the tradition at the United States Military Academy at West Point, New York, has been to graduate highly trained military officers. More than 900 cadets are commissioned annually and serve their country to protect our American way of life.

The Academy (established primarily to train engineers) and the United States Army Corps of Engineers® (which began its roots at West Point) have shared a close relationship and worked together to ensure that Army officers are prepared for their missions by providing optimum training and living facilities.

The Academy sits on the western shore of the Hudson River, approximately 50 miles north of New York City. This past winter, the Corps's New York District began restoring a historic dam and reservoir, near the shore of the Hudson River, on the grounds of the sprawling campus.

In the late 1800s, the Academy needed an additional source of drinking water. So in 1895, the Corps augmented the Academy's drinking water system by constructing the Lusk Dam and Reservoir, now considered significant elements within the Academy's National Historic Landmark property.

A Corps engineer stands on the recently constructed Lusk Reservoir Dam in 1895.

Photo by USACE, New York District

Lusk Reservoir Dam, West Point, New York

The reservoir dam is a large, arched masonry block structure. The dam—which was constructed under the direction of Captain James L. Lusk, a West Point graduate—created the reservoir. To date, water is piped in from area ponds and creeks to the reservoir.

In 2004, a Corps inspection—conducted by the New York District—showed that leaks were present behind a buildup of efflorescence (crystallization that had accumulated on the dam's surface), raising concerns that there could be a more serious problem down the road if the dam was left unmonitored. Since the dam is located upstream and adjacent to several high-occupancy Academy facilities, any potential structural problem is unacceptable.

During the winter of 2005, the New York District performed the dam's first cleaning in its more than 100 years of service. The joints on the downstream face of the dam were cleaned of the efflorescence, and the leaks that were covered by the crystallization crust were located, cleaned, and sealed. The cleaning provided the Corps a "fresh face" to observe and categorize the leaks present in the dam and determine if further repairs were needed.

Efflorescence is caused by the dissolving calcium carbonate in the dam's mortar. The reservoir water is slightly acidic and chemically reacts with the mortar between the dam's stones. When efflorescence builds up over the stones, it becomes difficult to determine the location of leaks because the water from a leak moves under the efflorescence crust and away from the leak source. By cleaning away the efflorescence, the leak's actual location is seen.

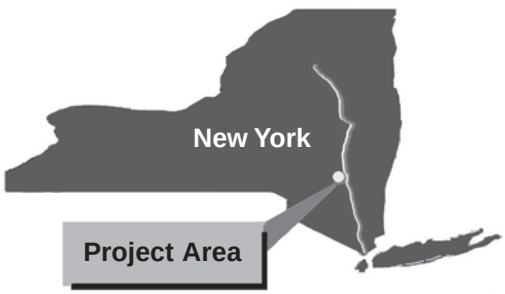
It took a month to clean the dam. The stones were sand-blasted clean with small coarse-grained silica (glass-like particles) under high water pressure, removing the calcite buildup along the seams of the dam's masonry stones. Workers performed the cleaning by standing on a platform (similar to those used by high-rise building window washers) that was lowered over the side of the dam's stone balustrade and 8-foot-wide brick walkway.

If the dam had not been cleaned, the Corps would not be aware of the severity of the seepage problem, which could have resulted in a more significant problem. The leaks are being monitored, not repaired, at this time.

Engineers who plan to perform similar dam restoration work should—

- Work closely with environmental and cultural resources staffs on the project because they can be invaluable in the selection of the proper cleaning method. Even though the main focus of the project is dam safety, it's important to remain aware of the environmental and cultural resource impacts of the work being performed.
- Ensure that there is enough time to perform the project. For example, if the dam is located in a cold-climate region, avoid the fall timeframe, which could shorten the restoration time.

In the near future, the Corps plans to inspect the structural condition of the Lusk Reservoir Dam's upstream face using a dive team because this portion of the structure needs to be visually examined. Corps personnel hope to correlate the leak locations on the downstream face with the upstream face cracks, which will allow them to determine what work is needed in the future.



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>.

The EOCA Course and the UMBC

By Mr. Michael Dascanio and Sergeant Major Joseph Harris

The United States Army Engineer School is committed to providing excellent training opportunities for all units in support of the Army Force Generation (ARFORGEN) cycle. We are constantly improving the courses and enrollment processes for the Explosive Ordnance Clearance Agent (EOCA) Course and the Urban Mobility Breaching Course (UMBC). We extend our congratulations to the organizations that have equipped their units with these valuable capabilities by sending Soldiers to these courses. We continue to receive excellent feedback from units in-theater and look forward to providing these capabilities to the rest of the Regiment.

Descriptions

EOCA Course. This course is designed to train skill levels 10 through 40 (E-4 [P] to E-7) combat engineers (21B) and select engineer officers (O-1 to O-3) on the basic skills and knowledge required to perform as EOCAs. These Soldiers will receive training in the following areas: reacting to an unexploded ordnance (UXO) hazard; EOCA roles and responsibilities: ordnance terminology; safety; color codes and markings; explosives and explosive effects; demolition operations refresher; EOCA Identification Guide overview and application; ordnance identification; protective measures; EOCA reconnaissance; marking; disposal of selected UXO (in-place only), as identified in the EOCA Identification Guide, in the conduct of engineer-specific area and route clearance operations, reporting procedures, and robotics. The course encompasses an intensive command post exercise (CPX)/ practical exercise (PE) to use newly acquired engineer skills in a series of explosive ordnance clearing operations.

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

Prerequisites

EOCA Course. To be eligible for this course, Soldiers must—

- Obtain an Armed Services Vocational Aptitude Battery (ASVAB) general maintenance (GM) score of 105 prior to January 2002 and 104 after January 2002.
- Be of the rank of E-4 (P) through E-7 and O-1 thru O-3.
- Have at least an interim secret security clearance.
- Have normal color vision.
- Be qualified in their military occupational specialty (MOS) 21B series.

UMBC. To be eligible for this course, Soldiers must—

- Meet the 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 in the grade of E-5 (P) through E-7 and a graduate of the Basic Noncommissioned Officer Course (BNCOC).
- Have no pending Uniform Code of Military Justice (UCMJ) actions.
- Have no limiting profiles.

We are continuing our efforts to support all units that are priority on the ARFORGEN cycle. Your support is needed as we proceed in equipping units with this EOCA/UMBC capability. Please comply with the enrollment instructions on page 56. We are currently allocating slots to each unit prior to deployment in order to support your training needs and increase your capabilities.

Allocations

ARFORGEN engineer units across the Regiment will have priority sequentially according to the ARFORGEN cycle to attend these courses. Each unit will be allocated three slots per class for the EOCA Course and UMBC. Unit representatives/S-3s must enroll Soldiers in these courses, using the Army Training Requirements and Resource System (ATRRS), once the unit receives allocations to attend the training.

Unit Requirements

Soldiers must receive basic familiarization demolition training from their unit before attending the EOCA Course. They must submit a memorandum signed by their unit commander, through the battalion or brigade commander, to the Directorate of Training and Leader Development (DOTLD), United States Army Engineer School, to confirm their name and attendance date. Soldiers must have at least an interim secret security clearance. Waivers can be approved for course attendance, with the exception of the security clearance requirement.

The Engineer School is in the process of recertifying Soldiers who are EOCA-qualified. To maintain the additional skill identifier (ASI) (E-8), there will be a certification course mobile training team (MTT) to train Soldiers.

Points of Contact

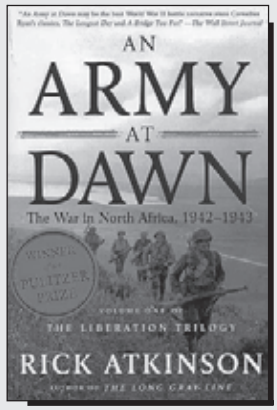
The points of contact concerning these courses are Mr. Michael Dascanio, the DOTLD Technical Director, United States Army Engineer School, (573) 563-4093; or Sergeant Major Joseph Harris, the DOTLD Sergeant Major, United States Army Engineer School, (573) 563-4093.

Urban Mobility Breaching Course		
Fiscal Year 2007 Schedule		
Class No.	**Report Date**	**End Date**
01	15 Oct 06	3 Nov 06
02	26 Nov 06	15 Dec 06
03	21 Jan 07	9 Feb 07
04	25 Feb 07	16 Mar 07
05	15 Apr 07	4 May 07
06	3 Jun 07	22 Jun 07
07	5 Aug 07	24 Aug 07

Submit an Article

The staff of *Engineer* welcomes articles concerning training, current operations and exercises, doctrine, equipment, history, personal viewpoints, or other areas of general interest to engineers. Send submissions by e-mail to <*engineer@wood.army.mil*>. For more specific instructions, see the *Engineer Writer's Guide* at <*http://www.wood.army.mil/engrmag/writersguide.htm*>.

Book Review



An Army at Dawn: The War in North Africa, 1942-1943, by Rick Atkinson, Henry Holt and Company, LLC: New York, 2002, 704 pages, ISBN: 0-8050-6288-2, $30 (hardcover).

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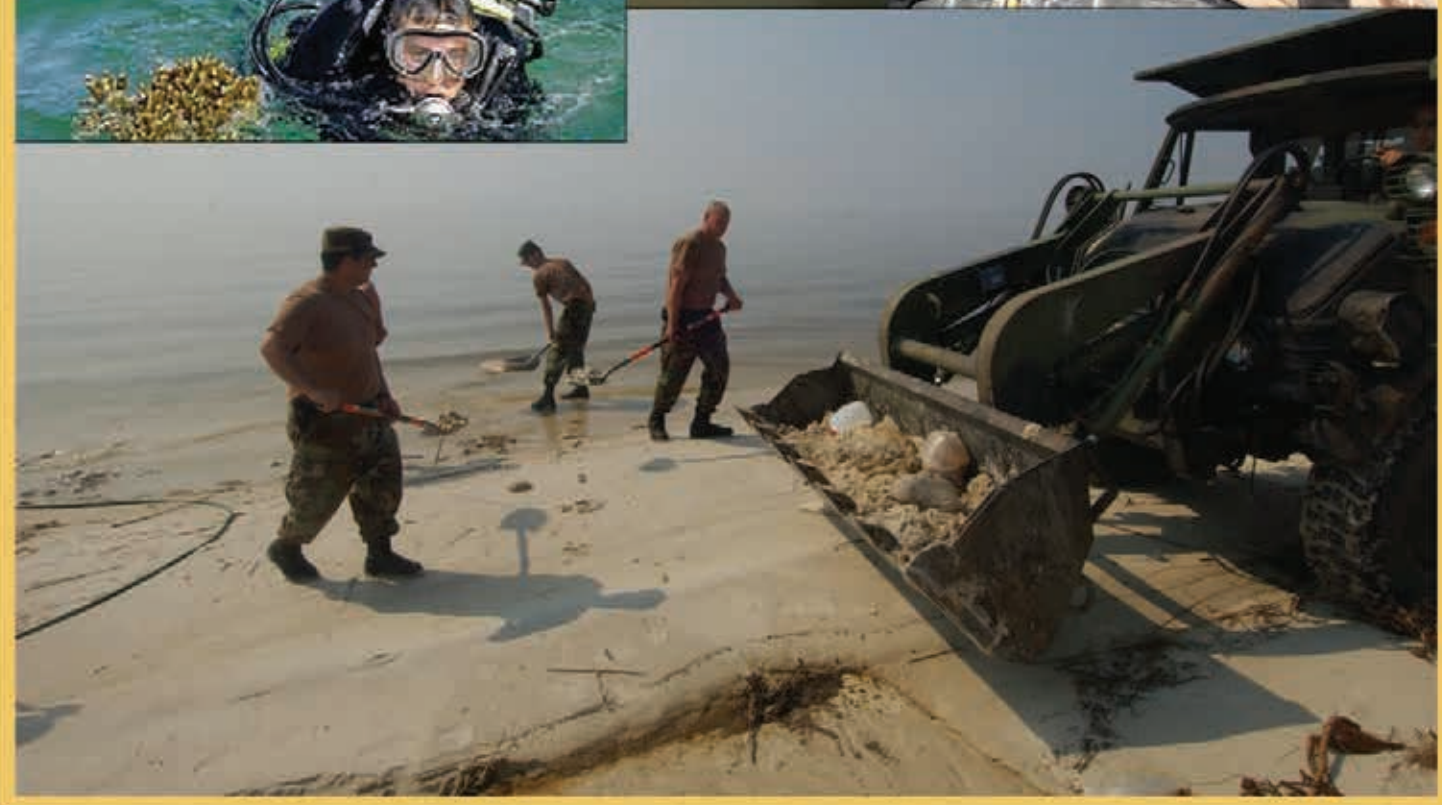
An Army at Dawn concerns America's initial involvement in World War II. Mr. Atkinson covers the coming of age of the U.S. armed forces and their leaders, to include many details—personal and political. No punches are pulled in the rivalry between British and American forces or their leadership. Names like Eisenhower, Patton, Bradley, Montgomery, Rommel, and Clark come to the forefront and remain there until the defeat of the Axis powers in Europe.

The Tunisian campaign, Atkinson shows, was undertaken by an American Army lacking in training and experience, alongside a British army whose primary experience had been of defeat. Green units panicked, abandoning the wounded and weapons. The author points out the numerous strategic and tactical errors made on the various battlefields. Mistakes were made not only by the generals but also by people in charge at lower levels. This included very basic errors, such as not sending out reconnaissance units or initiating tank attacks without proper artillery or air support. Many brave men were sent to their deaths in useless and ill-conceived actions. Sometimes, just the sheer confusion of the battlefield was responsible or just plain error, such as artillery falling short or planes bombing their own personnel. So, you see, this was where the Americans learned to fight the war.

As the first book in a trilogy, I can hardly wait for the next volume. Don't let the size of this book intimidate you; it is a fantastic account of a little-documented phase of America's entrance into World War II.

This book review is provided by Mr. Jeffrey L. Rosemann, an instructional systems specialist with the Officers Education Branch, Department of Training Development, United States Army Engineer School. A retired infantry Soldier, Mr. Rosemann also served as the 2d Infantry Division historian during the beginning of the 50th Anniversary of the Korean War.



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