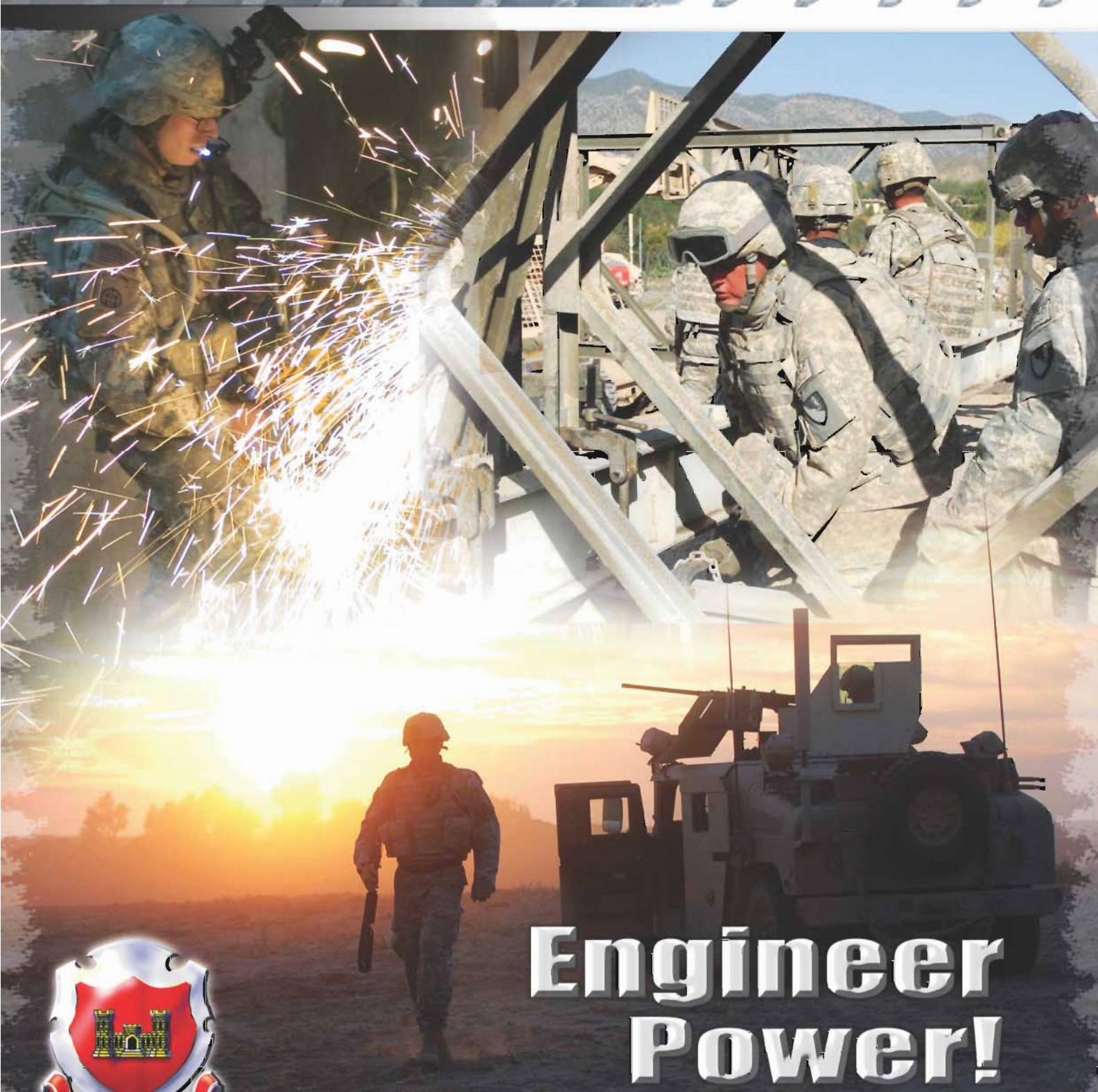
ENGINEER

The Professional Bulletin of Army Engineers

October-December 2007



Engineer Power!

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United States Army Engineer School

573-563-8080 / DSN 676-8080

COMMANDANT
BG Gregg F. Martin
563-6192
<gregg.martin@us.army.mil>

ASSISTANT COMMANDANT
COL Lou L. Marich
563-8080
<lou.marich@us.army.mil>

REGIMENTAL COMMAND SERGEANT MAJOR
CSM Clinton J. Pearson
563-8060
<clinton.pearson@us.army.mil>

DEPUTY ASSISTANT COMMANDANT–USAR
COL Loretta Deaner
563-8045
<loretta.angela.deaner@us.army.mil>

DEPUTY ASSISTANT COMMANDANT–ARNG
LTC Steven K. Knutzen
563-8046
<steven.knutzen@us.army.mil>

CHIEF OF STAFF
LTC Alfred Pantano
563-7116
<alfred.pantano@us.army.mil>

COMMANDER, 1st ENGINEER BRIGADE
COL Bjarne Iverson
596-0224, DSN 581-0224
<bjarne.iverson@us.army.mil>

DIRECTOR OF TRAINING AND LEADER DEVELOPMENT
COL Jerry Meyer
563-4093
<jerry.meyer@us.army.mil>

DIRECTOR OF ENVIRONMENTAL INTEGRATION
Mr. Robert F. Danner
329-1942
<robert.f.danner@us.army.mil>

COUNTER EXPLOSIVE HAZARDS CENTER
COL Richard M. Hornack
563-8142
<richard.hornack@us.army.mil>

HUMANITARIAN DEMINING TRAINING CENTER
Mr. Rodney A. Robideau
596-3870
<rodney.a.robideau@us.army.mil>

ENGINEER PERSONNEL PROPONENCY OFFICE
CW5 David D. LéVere
563-6137
<david.d.levere@us.army.mil>

MSG James L. Meriweather
563-7232
<james.meriweather@us.army.mil>

MANEUVER SUPPORT ORGANIZATION
LTC Leonard E. Wells
593-6282
<leonard.wells@us.army.mil>

By Order of the Secretary of the Army:
GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

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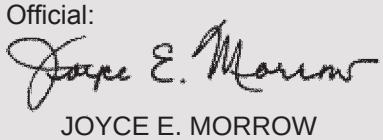

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
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Front Cover: Photos (clockwise) by Sergeant Mike Pryor, Captain Ashley Dellavalle, and Staff Sergeant Michael Carden

Back Cover: Army Values Poster (updated 2007)

FEATURES

DEPARTMENTS

Clear The Way

By Brigadier General Gregg F. Martin
Commandant, United States Army Engineer School

Maggie and I are very excited to return to Fort Leonard Wood, Missouri. We relish the fact that we, once again, are serving with such an effective and enthusiastic team. I would like to thank Major General Jack Sterling and his wife Cathy for providing such a smooth transition, which enhanced our ability to pick up where they left off in affecting the matters most pertinent to our Regiment, especially our people.

I would like to focus for a moment on one of the keys to success within our Regiment— effective communication. I welcome and encourage members of the Regiment to provide direct feedback and recommendations to me that will increase my ability to affect matters. I greatly value your input. I am wholeheartedly and passionately committed to advocating for our Regiment. I can be most effective with your support and feedback.

As you know, our Regiment is ascending from the trough of Transformation, to include addressing engineer support within the brigade combat teams (BCTs). An awesome amount of work has been done to ensure that we are providing relevant and responsive support to forces. We have an exceptional team of leaders involved who are absolutely the right people to address this difficult business. Please trust in them, as do I, to do the very best possible in support of our Regiment and the Army. I ask for your patience and commitment as we realize the effects of Engineer Transformation, especially within the engineer force pool over this next year.

I ask for the support of commanders and leaders to ensure that we maximize development and career progression opportunities for our Soldiers and leaders despite the demands of ongoing operations. It is imperative that we invest in them now to ensure our success today and in the future. Last quarter, Major General Sterling announced the addition of the Explosive Ordnance Clearance Agent (EOCA) Course to Fort Leonard Wood. The first course will graduate on 21 December 2007. Soldiers who attend this four-week course are awarded the E8 Additional Skill Identifier (ASI). Again, I very much recognize and appreciate the challenges of leaders and commanders as they prepare and care for Soldiers and Families preparing to deploy. It is my objective to facilitate your efforts to develop and train your Soldiers. I am committed to doing anything reasonably possible to help you to this end.

Recently, I had the privilege of recognizing one of our outstanding engineer Soldiers, Corporal (CPL) Kory D. Wiens and his specialized search dog (SSD), Cooper (K-154), who made the ultimate sacrifice in defense of our great nation. The team deployed to Iraq on 31 December 2006 in support of Multinational Division–Central. They saved numerous coalition and Iraqi lives by detecting explosives and other improvised explosive device (IED) manufacturing materials in the streets of Iraq. Kory and Cooper were killed by an IED while performing a dismounted patrol on 6 July 2007 in Muhammad Sath, Iraq. The CPL Kory D. Wiens Veterinary Hospital and Kennel was dedicated at Fort Leonard Wood on 4 December 2007. It will provide current and future engineer canine handlers with state-of-the-art facilities to support our teams. The facility provides 36 new kennel runs for these vital assets. This kennel increases the capacity of the engineer kennel space, making it the largest FORSCOM kennel.

As we begin the new calendar year, I ask each of you for your renewed emphasis on safety. Sadly and inexcusably, Soldiers, civilians, and Family members of our Army are injured or killed by avoidable circumstances. It is incredibly disheartening to know that members of our team are injured or killed due to failing to wear seatbelts, driving at reckless speeds, using cell phones while operating motor vehicles, and driving under the influence. Collectively, we can reduce and eliminate our injuries and losses and redirect the available time to celebrating the service, sacrifice, and achievements of our people.

Our deployed Soldiers and their Families are always in our thoughts and prayers. Thank you all for your service and sacrifice.

Army Strong!

Lead The Way

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

Greetings from Fort Leonard Wood! One of the most significant events here recently was bidding farewell to a member of our great command team, MG John Sterling and his wife Cathy. I would like to express my sincere appreciation to the Sterlings for the positive impact they made on Fort Leonard Wood, the Regiment, and the Army. We welcome BG Gregg Martin as the new Commandant of the Engineer School, and his wife Maggie, and look forward to serving with him and his family.

Our Regiment is experiencing one of the most challenging, dynamic, and rewarding periods in its history. The selfless service and sacrifice of our Soldiers, Civilians, and Families in support of the War on Terrorism is exemplary and a true testament to their commitment to defending freedom and our way our life.

The past year has brought huge positive impacts on our support of the Army's missions. We have blended the powerful capabilities of the Reserves, National Guard, and Active Army to provide a very responsive capability and function for our nation. The success of the Engineer Regiment transformation to the modular force is mainly due to the aggressiveness of the leaders throughout the Regiment and our great Corps.

The entire Regiment is on schedule with transforming to the modular force. The Reserves and National Guard are on pace to transform years ahead of schedule, and the Active Army engineers have passed the halfway point toward transformation to the modular force. Recently, the 8th Engineer Battalion (Combat Effects), 54th Engineer Battalion (Construction Effects), and 84th Engineer Battalion (Construction Effects) became modular units, which increases the capabilities available to the combatant commanders. Additionally, the activation of modular engineer units increases the opportunities for Soldiers throughout the Regiment. For example, the number of senior noncommissioned officers (NCOs) selected for promotion on the recent sergeants major list far exceeded previous years' numbers. Congratulations to all on your achievement!

The noncommissioned officers courses continue to focus on improving performance today while building tomorrow's sapper leaders. We continue to aggressively support resetting Army Force Generation (ARFORGEN) units though a blend of resident, distance learning, and mobile training teams. We will continue to focus on building skills that support the brigade combat team (BCT), interim brigade combat team (IBCT), and Stryker brigade combat team (SBCT) commanders and the modular engineer units. The engineer Advanced Noncommissioned Officers Course (ANCOC) and Basic Noncommissioned Officers Course (BNCOC) are continuing to provide the Regiment's NCOs with the professional development and current task-based rigid training needed to lead today and tomorrow. We continue to improve in our 72-hour situational training exercise (STX), which allows NCOs to share their deployment experiences with each other. The exercise serves as a culmination of all tasks covered during the course, with emphasis on troop-leading procedures (TLP) in the current and contemporary operating environment.

BNCOC also places a significant emphasis on TLP and the execution of route clearance, traffic control point, cordon and search, force protection, access control, and quick-reaction force (QRF) missions. All missions are enhanced thought the incorporation of improvised explosive device (IED) simulators, realistic training aids, and civilians on the battlefield.

The Counter Explosive Hazards Center (CEHC), the Army's Center of Excellence for countering explosive hazards, is training and updating the force in current counter explosive hazards techniques and employment of commercial off-the-shelf (COTS) and contingency equipment. This instruction enables units to receive theater-specific training prior to deployment and allows them to focus on the mission during transfer of authority. To ensure that the training is up to date and relevant, the CEHC gathers the latest intelligence on explosive hazards tactics, techniques, and procedures (TTP) employed by the enemy as well as TTP developed by deployed units to counter that threat.

We are continuing our efforts to bridge the gap with explosive ordnance disposal (EOD), as the Explosive Ordnance Clearance Agent (EOCA) Course moves to Fort Leonard Wood this quarter. This move will increase our ability to find new solutions and provide better training for engineer Soldiers.

Finally, continue to focus on the War on Terrorism, maintaining high standards and leading the way as engineers do. May God bless the fallen comrades and keep watch over all Soldiers, Families, and Civilians as we continue the fight.

Like No Other:

The Battering Rams in Operation Iraqi Freedom

By Lieutenant Colonel William H. Graham, Major Jason A. Kirk, and Major Gary D. Calese

Like no other. This phrase certainly characterizes the year-long tour that the 40th Engineer Battalion "Battering Rams" recently completed in Operation Iraqi Freedom (OIF). It was like no other in that this formation—fighting organically to the 2d Brigade Combat Team (BCT), 1st Armored Division (1AD)—is one of the Army's last two maneuver BCT-supporting Engineer Reconstruction Initiative (ERI)–Modified Table of Organization and Equipment (MTOE) combat engineer battalions in the Army. (The other is the Schweinfurt, Germany-based 9th Engineer Battalion.) It was like no other in that the Soldiers of the battalion and brigade headquarters served the first half of their tour stationed at Camp Buehring, Kuwait, assigned as the first-ever Central Command (CENTCOM) "theater reserve brigade." It was like no other in that the battalion spent time shepherding the sapper companies through their precommitment engineer-focused training as they deployed into Iraq attached to their habitually supported maneuver task forces. The battalion then evolved into a sort of brigade troops battalion, with administrative control (ADCON) over the brigade's separate military intelligence, signal, military police, and reconnaissance troops. Finally, the battalion served in Baghdad with operational control over one of the modular "Echo" companies of sappers from a 4th Infantry Division combined arms battalion maneuver task force, a civil affairs company, the BCT's reconnaissance troop, an explosive ordnance disposal (EOD) company, and the battalion's headquarters company, while retaining ADCON of the military intelligence and reconnaissance troops. This like-no-other script was one that none of the Battering Rams could have written as they conducted their predeployment gunnery and mission rehearsal exercise in the fall of 2005. While much of the year that concluded in November 2006 was like no other, the experiences and lessons learned of the 40th provide valuable information for other engineer formations across the Engineer Regiment.

An engineer from the 40th Engineer Battalion operates a Bobcat® in Ramadi.

The 40th had three highly trained sapper companies that deployed ready to conduct engineer tasks across the full spectrum of combat and stability operations, and a proficient and flexible staff that could plan and command and control a variety of missions across their supported BCT's battlespace. This article will detail the experiences and share the lessons learned by the 40th as it planned, prepared, and executed full-spectrum operations. The battalion's guiding philosophy was to approach all missions in a disciplined and aggressive manner. The battalion's motto—*Constructio et Destructio* (Construction and Destruction)—characterizes the breadth of engineer and nonengineer missions its Soldiers would face during OIF.

Engineer LOOs

The 40th command group used its base mission-essential task list to refine a template of engineer lines-of-operations (LOOs) to guide training efforts during the predeployment mission rehearsal exercise and the training time that presented itself when the battalion was designated as the CENTCOM theater reserve brigade in Kuwait. Nested within the BCT's effects-based operational construct, the 40th prepared to conduct nine LOOs.

The 40th Engineer Battalion emplaces countermobility barriers in Ameriya, Baghdad.

BCT Effect No. 1—Promote a safe and secure environment.

Engineer LOO No. 1. Conduct counter improvised explosive device (counter-IED) operations. Finding and training ways to counter the IED threat—the primary killer on the OIF battlefield—was paramount. The summation of the 40th's counter-IED lessons follows:

- Make every Soldier an IED detector by training multiple iterations with a variety of concealed IEDs.
- Make sappers the counter-IED experts for the supported maneuver element. During training time in Kuwait, 40th Engineer Battalion noncommissioned officers (NCOs) and lieutenants advised maneuver task forces on the development of counter-IED training lanes.
- Develop a counter-IED "Red Team" to support training at both the command and staff levels and at the crew and platoon levels. The battalion dedicated an opposing force element within the engineer reconnaissance platoon to build and employ a wide variety of training IEDs during counter-IED lane training for the entire BCT.
- Synchronize, synchronize, synchronize. The 40th provided command and control for the BCT's EOD response and escort operations.
- Use Fort Leonard Wood's Counter Explosive Hazards Center and other "schoolhouse" training courses such as—
  - ► The Route Reconnaissance and Clearance Course for valuable hands-on time with Buffalo armored personnel carriers, RG-31 mine-protected vehicles, and Husky mine detector vehicles.
  - ► The Route Reconnaissance and Clearance Course–Sapper for counter-IED TTP for units without the clearance equipment package.
  - ► The Explosive Ordnance Clearance Agent (EOCA) Course to train NCOs and junior officers in skills that help bridge the gap between sappers and their EOD brethren.
- The 40th had operational control of the 754th Ordnance Company (EOD) and responsibility for EOD response across the BCT area of operations (AO). This facilitated the most expeditious response and a centralized means to prioritize response to IEDs, weapons caches, and blast crater analysis.

Engineer LOO No. 2. Collect, secure, and destroy unexploded ordnance (UXO) and captured enemy ammunition.

- The 40th trained on the TTP for these engineer tasks. Though the two companies stationed in Al Anbar Province completed a few disposal missions, the primary lesson learned was that EOD forces took on the majority of these missions. Related to LOO No. 1, the 40th emphasized the utility of passing the details of all recovered IED-making materials to the BCT's S2/counter-IED fusion cell.

Engineer LOO No. 3. Conduct force protection assessments, construction, and upgrades to critical coalition forward operating bases (FOBs) and combat outposts and to critical Iraqi municipal and other governmental facilities and infrastructure sites.

- All three line companies, the battalion staff, and the headquarters company engaged in this critical task.
- As a "force protection planner," the battalion S2 officer conducted site assessments across the BCT AO and made detailed perimeter barrier and entry control point upgrade designs for these sites. Charlie Company and the support platoon from Headquarters and Headquarters Company designed and emplaced combat outposts for use by American and Iraqi security forces.

A 40th Engineer Battalion Soldier distributes claim cards in southwest Baghdad. The cards allow Iraqis to seek reimbursement for damages caused by coalition forces.

Engineer LOO No. 4. Maintain trafficability of main supply routes (MSRs) and other critical lines of communication (LOCs).

- For this LOO, the 40th maintained the BCT's situational awareness of the status of MSRs and alternate supply routes, then focused counter-IED route clearance patrols, blast hole repair missions, and sometimes counter-IED reconnaissance with the BCT's reconnaissance troop to address the most hazardous routes.
- Both the S2/counter-IED fusion cell's tracking of IED hotspots and maneuver task force requests for support helped to focus support efforts for these mobility missions.

Engineer LOO No. 5. Provide general engineering support to FOB life-support infrastructure and quality of life improvements.

- The 40th learned two primary lessons in conducting this traditional engineer LOO. First, the modernized Kipper™ tool kits proved highly valuable. The MTOE should authorize not one, but three Carpenter's Power Tool Kits (Line Item Number [LIN] (W34511) and three Pioneer Manual Labor Tool Kits (LIN W48074) per company. The Kipper Plumber's Tool Kit and Electrician's Tool Kit (LIN W49033 and LIN W36977) also proved useful to combat engineers establishing combat outposts (COPs) at austere sites.
- The other lesson learned was that due to the shortage of Army construction units, the high demand for missions that civilian contractors couldn't perform, and the lack of general engineering capability in the divisional (or BCT) engineer units, many BCT-level general engineering missions were delayed until sufficient division- or corps-controlled assets became available. To fill this gap, some BCT engineer units scrounged available theater-provided equipment (TPE). The 40th's recommendation is to add a minimal level of general engineering equipment, such as two bucket loaders, a D7 bulldozer with haul asset, and three 5-ton dump trucks (or palletized load system vehicles with dump modules) to the combat engineer battalions. This would give the BCT tremendous flexibility and serve as a base for additional capability if sufficient TPE is available. These upgrades would allow the ever-flexible engineer Soldiers to apply their skills to provide valuable quality of life and force protection to forces at FOBs and COPs.

BCT Effect No. 2—Promote Iraqi confidence in their government.

Engineer LOO No. 6. Evaluate and improve Iraqi municipal infrastructure—sewage, water, electricity, academics, trash, and medical (SWEAT-M).

Engineer LOO No. 7. Enable and empower a capable and credible Iraqi government.

By conducting LOOs No. 6 and No. 7, the 40th played a critical role in the BCT's effort to build faith among the Iraqi people that their government can provide essential services such as clean water, electricity, andsanitation. The primary lessons learned follow:

- Incoming units must understand the personalities within the AO's governance and public works structure, the tribal leaders, the current status of SWEAT-M services, and the status of ongoing infrastructure projects. Civil affairs units—often on staggered or "off-cycle" rotations from the maneuver BCT's—are an important source for this information. The credibility of U.S. forces is diminished when they are not familiar with the status of ongoing projects and local priorities. While a new unit may feel the urge to jump into its area with quick solutions, it will be more useful to true progress to spend time learning how systems operated under the Saddam regime, what coalition efforts have already been attempted, and what long-term solutions are currently in the works.
- The 40th Engineer Battalion commander, like most brigade troops battalion commanders in adjacent BCTs, served as the BCT commander's lead agent for BCT-wide civil-military operations (CMO) efforts. The lesson learned is that much will be gained in establishing relationships with the interagency players, especially the United States Agency for International Development (USAID) and the United States Army Corps of Engineers® (USACE), that have ongoing projects within the AO.
- The approach to CMO responsibilities evolved over the course of operations. They found much success by running a "nonlethal effects working group," chaired by the BCT executive officer (XO), to synchronize CMO efforts along with information operations (IO), psychological operations (PSYOP), public affairs, and other non-lethal targeting operations. The brigade fire support officer led the IO, PSYOP, and public affairs sections while the battalion XO led the brigade civil-military affairs section and the infrastructure project management section.

BCT Effect No. 3—Transition to a democratic and independent Iraq.

Engineer LOO No. 8. Train Iraqi army EOD personnel in IED defeat.

Engineer LOO No. 9. Train Iraqi army engineers.

The battalion's Bravo and Charlie Companies conducted a significant number of combined operations with Iraqi Security Forces (ISF) from the National Police and Iraqi army. Contrary to their predeployment assumptions, the 40th was paired with standard "line formations" instead of Iraqi EOD or engineer personnel. All U.S. units in Iraq will work with ISF, applying persistence and patience as they work toward the objective of putting the ISF in the lead. Predeployment Arabic language and culture training and formal exercises working through interpreters helped prepare the 40th for these combined operations.

Summary

This LOO construct is similar to the one developed in 2005 and details how the battalion's initial planning and training efforts compared to the actual mission sets that the 40th was called on to execute.

While the battalion's deployment met with successes and failures, it reports that having predeployment training guided by a broad set of engineer LOOs and supporting tasks was extremely valuable. Additionally, the engineer task proficiency focus provided by engineer battalion leaders during the predeployment and theater reserve status training time helped prepare the battalion for the broad spectrum of engineer and nonengineer missions it was called on to perform. All of these formations report that training for the counter-IED fight as an engineer mobility mission will make not only the engineer companies, but their task forces and the BCT, more successful. As the Battering Rams prepare for their next operational commitment, they will draw on the lessons of this most recent and *like no other* OIF rotation.

Lieutenant Colonel Graham served as commander of the 40th Engineer Battalion "Battering Rams" during this OIF rotation. He now serves as Division Engineer for the 1st Armored Division (1AD) as he prepares for his third OIF rotation. His past assignments include tours of duty with the 1AD Engineer Brigade; the USACE Pittsburgh District; and the 588th, 1st, and 23d Engineer Battalions.

Major Kirk was the 40th Engineer Battalion executive officer during this OIF rotation and now serves as the 2d BCT/1AD executive officer. He has also served with the USACE New Orleans District and the 299th and 11th Engineer Battalions.

Major Calese was the 40th Engineer Battalion operations and training officer during this OIF rotation and now serves as the battalion executive officer. He has also served with the Sidewinders Team at the National Training Center, Fort Irwin, California; the 52d Engineer Battalion; and the 505th Multirole Bridge Battalion.

Full-Spectrum Bridging Operations in Iraq

By Second Lieutenant Scott D. Eshom

With Operation Arrowhead Ripper only weeks away, insurgents targeted and successfully rendered a key regional bridge impassible with a vehicle-borne improvised explosive device (VBIED). Located north of insurgent hotbed Baqoubah, the bridge had served as a passageway over the Diyala River. Operation Arrowhead Ripper, part of the larger Operation Phantom Thunder, was an overall offensive to clear insurgent-held cities, maximizing the surge capabilities of coalition forces. With passage over the Diyala River limited, elements of Task Force Lightning and other forces preparing for cordon-and-search operations in Baqoubah could not effectively carry out their mission. The 502d Engineer Company (Multirole Bridge) and elements of the 92d Engineer Battalion (Combat) (Heavy) answered the call for assistance.

Part of the Mabey-Johnson bridge is pulled down with two D7 dozers.

The mission was simple: deploy an assault float bridge (AFB) and improve the near- and farshore approaches to permit traffic access to the temporary bypass. Knowing the urgency of the mission, elements of the 92d prepared for the movement and site work during the night. The operation was broken into three phases: movement to the site and nearshore preparation to provide access for the 502d bridge assets; bridge emplacement; and farshore preparation, roadwork completion and testing, and movement back home.

Although the 502d emplaced the bridge, the most demanding phases of the operation required the improvement of both shores and the construction of a roadway. Soldiers

Photo by Second Lieutenant Nicholas Soroka

Soldiers from the 502d Engineer Company use a bridge emplacement boat to stabilize the new bypass bridge while it is being anchored. A HYEX on the far shore works to improve the approach.

A D7 dozer clears the roadway, pushing the damaged Mabey-Johnson bridge into the Tigris River.

from the 92d Headquarters Support Company, the 502d Support Platoon, and Bravo Company provided construction and earthmoving assets and immediately started work on the nearshore approach. D7 dozers and graders worked nonstop for 24 hours to improve the trail running parallel to the existing highway and the bridge structure. After several hours of hard work, the noncommissioned officer in charge deemed access to the near shore of the existing bridge sufficient. Hydraulic excavator (HYEX) operators began improving the slope and approach of the river bank to provide 502d bridge assets ample room to maneuver and launch their improved ribbon bridge (IRB) bays and boats.

Soldiers from the 502d's 2d Platoon, worked overnight to emplace the IRB bays needed to bridge the gap. Once ready to cross, D7 dozer operators began work on the far side to complete access to the highway. The skilled HYEX, grader, and dozer operators of the 92d worked around the clock to clear concrete debris off the dirt path, widen and fill areas with several dump truck loads of gravel, and level out the approach from the bridge on the far shore.

To ensure that the new road and bridge were effective, site leadership required a test run. Operators loaded up heavy equipment pieces to mimic the standard convoy that uses the bridge. With successful passage across the intersections leading off and onto the highway, the improved road, and the bridge, the Soldiers who contributed to the mission knew they had done something special. Military convoys immediately began to use the new road and bridge, and days later, Operation Arrowhead Ripper kicked off.

Coordination with the 92d's engineer assets was an important factor in mission success. With knowledge of the bridge site needs of the 502d, site leaders effectively directed ground operators on worksite priorities. Knowledge of military vehicle turning requirements led to a successful test run with sharp turns off and onto the highway. And when the initial mission was complete, the 92d responded to an urgent order to clear the damaged Mabey-Johnson bridge from the existing concrete bridge. Winched to the hulking 70-ton Mabey-Johnson bridge, two D7 dozers successfully cleared the roadway, and the 502d's 1st Platoon replaced the Mabey-Johnson bridge. The implementation of full-spectrum bridging operations by the 502d Engineer Company and the 92d Engineer Battalion enabled both the successful execution of Operation Arrowhead Ripper and the long-term assured mobility needs of the region.

Photo by First Lieutenant Brad Stubblefiel

The 502d 1st Platoon bridges the gap of the damaged Al Taji Bridge, pushing the damaged Mabey-Johnson bridge 45 meters across the Tigris River.

Second Lieutenant Eshom is the support platoon leader for the 502d Engineer Company (Multirole Bridge), Hanau, Germany. He completed the Sapper Leader Course in February 2007 after the Engineer Officer Basic Course at Fort Leonard Wood, Missouri. He holds a bachelor's in international relations and French studies from American University, Washington, D.C.

Breech From Kuwait To Iraq

By First Lieutenant Joshua Blalock

Engineers must solve many problems before any project or mission can start. The 186th Engineer Company's Task Force Denali overcame a unique problem during a mission to clear the new convoy route from Kuwait to Iraq during April and May 2007. The problem was that the task force needed to cross a 39-inch pipeline that runs the entire length of the border between Kuwait and Iraq. The Kuwaiti government owns the pipe and would allow it to be cut the day traffic started moving on the new route, but no earlier. Even though the government had approved the route, it did not want the pipe cut prematurely, and coalition convoys could not roll on the new route until two turnarounds were built and eight culverts had been cleared. The 186th would be responsible for breeching the border and meeting the route clearance requirements. The bulldozers, scrapers, and graders needed by Task Force Denali to clear the new route had to cross the border, but could not simply jump 39 inches to get across the pipeline. A delay in opening the new route would have meant five more months of using the previous convoy route, which travels near two cities in Iraq that pose a tremendous and constant threat to U.S. forces. A delay would mean putting Soldiers in undue danger.

Two lowboy trailers, each loaded with another lowboy trailer, were hauled to the site.

Several solutions were considered. One option was to build an earth ramp that would cover the pipe and road and slope enough to allow vehicles to drive over it. This would call for a bulldozer to push dirt high enough on the road to clear the top of the pipe. A second option involved backing two M870 lowboy trailers against each

Cranes set HMMWVs on the Iraqi side of the pipeline for the security platoon.

other over the pipeline. A third option was to take one M870 lowboy trailer and back it against the pipe while building an earth ramp on the other side. The fourth option was to cross into Iraq on Main Supply Route Tampa and take a long detour to get to the new route.

With each potential solution came additional problems. Earth ramps on both sides of the pipe would use a crane to place a bulldozer on the far side of the pipe to push dirt. The amount of dirt required would leave large holes. This option could also leave holes in the asphalt when the bulldozer was working to build the ramp, and all the dirt from the ramp would have to be removed before the route opened. The third option would also use dirt that would need to be removed. The last option would take too much time and would also put the engineers on the much more dangerous route. Thus, it was decided that the best option was to use the M870 lowboy trailers to form a bridge into Iraq.

The noncommissioned officer (NCO) in charge of the mission used 16 Soldiers from 2d Platoon for the breeching mission. The idea for using the trailers still needed to be tested to make sure it would work. With help from the maintenance platoon, the NCO and his team measured the height of the trailers to ensure that they would sit high enough to clear the obstacle. The Soldiers backed two trailers against each other and took measurements—each stood exactly 39 inches at its crest. The next step was to ensure that the trailers could withstand the weight of the engineer equipment being driven across them. The trailers would have to hold the weight of the equipment plus the weight of the truck hauling the equipment. The test proceeded without a hitch.

Now other problems came to light. The engineers did not want to disturb the pipe at all, but the trailers backed against the pipe left a gap. They used rubber matting, sand bags, and ¾-inch steel plating to cover the gap across the pipe. The next problem was the fact that the trailers would be sitting directly on the asphalt. Rubber matting was placed beneath the drop necks of the trailers to protect the road. Wood braces sat directly underneath the trailers to prevent their suspension system from giving under the weight of the equipment. The last concern was that the trailers themselves might shift and roll into or away from the pipe. A trailer's brakes will lock once the trailer is detached from a truck, but they are only designed to hold as equipment is driven onto the trailer, not while having that equipment loaded onto another truck and driven across. The Soldiers for the breeching mission used chains to hold the trailers in place against each other and the pipe.

The first convoys on the new route were scheduled for 15 May, so the breeching mission was set for 16 April to make sure the engineers crossing the border would have enough time

Braces underneath the trailers prevented their suspensions from giving when traffic crossed.

to construct the turnarounds and clear the required culverts. Four lowboy trailers were placed to ensure that there would be enough room for traffic to cross. The two cranes for the mission were a military 22T crane and a civilian 50T crane. Two lowboy trailers, each loaded with another lowboy trailer, were hauled to the site. Cranes set high-mobility multipurpose wheeled vehicles (HMMWVs) on the Iraqi side of the pipeline for the security platoon. Then the cranes moved two lowboy trailers to the Iraqi side of the pipeline and set them as close to the pipe as possible without damaging it. Rubber matting was placed beneath the trailers, and sandbags, matting, and steel plates were set into place on the pipe. The crew left a 1-foot gap between the side-by-side trailers to give them room to shift safely. Chains were attached only to the outside portions of the four trailers to help the brakes hold them in place. Steel plates covered the holes in the trailers where the hookup and chains are kept. Braces underneath the trailers prevented their suspensions from giving when traffic crossed. Sandbags were placed at the bottom of each ramp to allow the equipment an easier way to drive onto the bridge. The completed bridge measured 106 feet long and 17 feet wide, which was enough space for any equipment to cross. The breech took two hours to complete and allowed the security platoon to cross back into Kuwait without having to be picked up by a crane.

The Soldiers crossed the border and completed the safer route for convoys going in and out of Iraq. The pipe was then cut, the temporary bridge removed, and the new route opened on time, thanks to the leadership, teamwork, and the "never quit" attitude of these engineers.

First Lieutenant Blalock was deployed as a platoon leader with the 186th Engineer Company (Combat Support Equipment) in support of Operation Iraqi Freedom. He holds a bachelor's in physical education, teaches physical education at Headland Elementary School, and coaches high school football and baseball in Headland, Alabama.

The Engineer Writer's Guide

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

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

Include photos (with captions) and/or line diagrams that illustrate information in the article. Please do not include illustrations or photos in the text; instead, send each of them as a separate file. Do not embed photos in PowerPoint®. If illustrations are in PowerPoint, avoid excessive use of color and shading. Save digital images at a resolution no lower than 200 dpi. Images copied from a website must be accompanied by copyright permission.

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

Articles submitted to Engineer must be accompanied by a written release by the author's unit or activity security manager prior to publication. All information contained in the article must be unclassified, nonsensitive, and releasable to the public. Engineer is distributed to military units worldwide and is also available for sale by the Government Printing Office. As such, it is readily accessible to nongovernment or foreign individuals and organizations.

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Send submissions by e-mail to <*leon.engineer@conus.army.mil*> or on a 3 1/2-inch disk or CD in Microsoft Word, along with a double-spaced copy of the manuscript, to: Managing Editor, Engineer Professional Bulletin, 464 MANSCEN Loop, Suite 2661, Fort Leonard Wood, Missouri 65473-8926.

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

Planning a New FOB in Afghanistan

By Second Lieutenant Michael P. Carvelli

Moving a unit to a new forward operating base (FOB) requires extensive logistical coordination that must be in place before the move can occur. Classes of supply, services, and contracts have to be extensively planned, pre-positioned, and synchronized in order to expose Soldiers to the minimum amount of risk with the greatest probability of success. The commander and staff must balance residual risk with the effects achieved.

At the staff level, the executive officer coordinates between all staff sections—to include the operations and training (S3) section and a representative from the occupying company or platoon—in order to achieve this coordination and solve preoccupation issues. Each section has an important role in assisting with assessing the terrain, forecasting classes of supply with an emphasis on construction materials, coordinating ground and air movements, and emplacing the necessary contracts to achieve success.

The intelligence officer and topographic engineers have a wide array of intelligence, surveillance, and reconnaissance assets, giving the commander a template to plan the footprint of the FOB or combat outpost. Some of these assets not only display the topographic map but also assist in range fans, observation post emplacement, and other vital areas typically forgotten during staff planning. Also, the S3 air should be included in the map reconnaissance to suggest possible landing zones and drop zones for container delivery system (CDS) bundles, medical evacuation, and rotary-wing resupply operations.

If the site has already been selected by the unit on the ground, an initial physical reconnaissance should be conducted. Suggested personnel for this reconnaissance include engineers, the unit supply (S4) sergeant or S4 representative, and current pathfinder- or jumpmaster-qualified Soldiers or Airmen familiar with the certification paperwork for landing zones and drop zones. This allows the initial setup of the landing zone and drop zone; logistical forecasting emphasizing construction materials; a tentative outline of force protection measures; and some staff-level familiarity with the soil conditions, water table, and terrain.

"The intelligence officer and topographic engineers have a wide array of intelligence, surveillance, and reconnaissance assets, giving the commander a template to plan the footprint of the FOB or combat outpost."

After the initial site has been selected, a contingency real estate support team (CREST) needs to be coordinated to legally secure the land. However, in the reconnaissance of this site, the reconnaissance team must set the conditions for success through negotiations with the local leaders and populace. Initial discussions with the local populace can provide the CREST with a toehold from which to launch their operations.

Once the initial reconnaissance has occurred and the land has been approved, the S4 and engineers need to generate a supply request for triple-strand concertina, HESCO Bastion

Afghani contractors fill sandbags for use at the new FOB.

Concertainers®, dimensional lumber, plywood, sandbags, tents, and power generators, which are needed immediately for the Soldiers or engineers performing the initial construction. These materials allow a perimeter, observation posts, entry control points, and a tactical operations center to be constructed. And due to the current operating environment, bunkers to protect Soldiers from indirect fire and small arms fire should be incorporated into the initial construction phase. In addition, meals, ready to eat (MREs); bottled water; and fuel need to be requested for the occupying unit.

The engineer is responsible for determining where the fill material will be obtained for the HESCO barriers and sandbags. Since not all engineer units in Afghanistan are used in their typical roles, the brigade engineer company or attached engineer units may not be available to perform these construction tasks. If the soil conditions prevent the use of in-situ soil due to its poor characteristics, or if there is a lack of engineers or heavy equipment, the unit's contracting officer will not only have to coordinate the fill material requirements but may be required to contract heavy equipment such as bucket loaders, hydraulic excavators (HYEXs), and dump trucks.

If these contracts cannot be immediately attained, the money needs to be dedicated. Under the supervision of a contracting officer, a field ordering officer (FOO) can use cash to make small purchases locally, which can help offset the lack of contracts. Large amounts of fill material (over 1,000 cubic meters), heavy equipment contracts for extended periods of time (over 10 days), and dimensional lumber and plywood cannot be purchased from the local economy. After spending the money for local purchases, there is a one- to two-week process to clear the paperwork, fund, and redraw money.

Once the staff has completed the reconnaissance and a logistical forecasting and contract process has been initiated, a realistic occupation timeline can be created for the occupying unit. These three elements provide the commander with a feasible, realistic plan to construct and occupy a new FOB. However, coordination of ground and aerial resupply routes; movement of construction materials; and contracts for local labor, equipment, and fill material must be coordinated and synchronized for the unit's occupation.

Second Lieutenant Carvelli is the Task Force Engineer, Special Troops Battalion, 173d Airborne Brigade. He was previously assigned to Alpha Company, 554th Engineer Battalion, Fort Leonard Wood, Missouri. He is a graduate of the Engineer Officer Basic Course and the United States Army Ranger School and holds a bachelor's in civil engineering technology from the Rochester Institute of Technology.

Knowledge Management for the Base Camp Community of Practice

By Major Travis (TJ) Lindberg and Mr. Albert M. Vargesko

"A good company idea in tactics is likely to remain confined to one company indefinitely, even though it would be of benefit to the whole military establishment..." [1]

—S.L.A. Marshall, 1947

"...whereas the flow of knowledge within a business process is (1) easier to determine and (2) easier to optimize, it is the flow of knowledge between business processes, the interfaces between different organizational units and topics that might provide the highest potential for innovation and competitive advantages." [2]

—Ronald Maier, 2004

There are a handful of well-known and widely used standards and references to manage the design, construction, operation, maintenance, and retirement[3] of base camps[4] (such as Red Book, Sandbook, Assistive Technology [AT] Planner, Theater Construction Management System [TCMS], and Geographical Base Engineer Support Tool [GeoBEST]). However, there is no single Department of Defense (DoD) standard or authoritative body that addresses the life cycle tasks or funding issues related to base camps, and if you visit 20 forward operating bases in Iraq, you will find 20 different designs. For efficiency and standardization, it makes sense to share knowledge of construction, operations, and maintenance of base camps. This article describes the initiative started at the United States Military Academy (USMA), West Point, New York, and how it progressed to the creation of a knowledge management (KM) collaboration website that is now maintained by the United States Army Engineer School.

Building Knowledge

The Department of Systems Engineering at USMA became interested in studying military base camps as a real-world example of a system students would be immersed in early in their military careers. After the fall of the Berlin Wall and the collapse of the Soviet Union, the U.S. military increased the pace and reach of its operations. Military units now routinely deploy worldwide to fight wars, participate in peace enforcement and peacekeeping missions, train foreign armies, and respond to humanitarian crises. To support these operations, the military develops temporary base camps, which are complex systems with many integrated components that follow a life cycle pattern and thus provide an excellent educational opportunity for students of systems engineering.

Base Camp Workshops

Between 2001 and 2005, the USMA Department of Systems Engineering and the Department of Civil and Mechanical Engineering—in conjunction with the United States Army Corps of Engineers® (USACE) Engineer Research and Development Center (ERDC)—conducted a series of annual workshops to bring together practitioners from the Base Camp Community of Practice (CoP). The 2001 workshop identified that the CoP was indeed wide and varied and that the issues facing it were extensive.

The next workshop was held in March 2004, and the theme was "Base Camps of Today and Tomorrow." The workshop forum solicited input from the diverse Base Camp CoP regarding these fundamental domains of base camp study: initial planning, site selection, environmental issues, structures, power supply, and force protection. The forum was useful for information sharing; however, the lessons were short-lived because there was no continuous means to keep the Base Camp CoP together.

At the third workshop, held at West Point in May 2005, researchers and practitioners with recent field experience in developing and running base camps focused on sharing best practices among the Base Camp CoP. Three key issues were identified:

- DoD needs to simplify the funding processes for base camp development.
- DoD and the Services need to establish organizations as proponents for the Base Camp CoP.
- A system is needed that allows Base Camp CoP members to share knowledge related to the life cycle management of base camps and Joint forward operating bases (JFOBs).

To address the third issue, USMA initiated a study to determine the requirements for a KM system that could be used by the larger Base Camp CoP to help military units better understand base camp life cycle management-related tasks. The intent was to complete the study before the fourth workshop in May 2006 in order to present the findings and begin the implementation of the KM system at that time.

At about the same time, the Engineer School volunteered to host the 2006 workshop in St. Louis, Missouri, as part of the 2006 ENFORCE Conference. And the School offered to serve as the Army's proponent for base camp-related issues, thereby effectively addressing the second (and probably most significant) issue affecting the Base Camp CoP. Three important results came from the 2006 workshop:

- The Battle Command Knowledge System (BCKS), an existing Army system, was chosen to host a Base Camp CoP or "forum."
- The name of the collaboration site, "ArmyBaseCamp/JFOB.net," was chosen.
- The Engineer School was identified to provide the leaders and administrators to populate the database and maintain the website.

Collaboration Site

Becoming a member of the ArmyBaseCamp/JFOB.net professional forum is simple, although it requires an Army Knowledge Online (AKO) account. Logon to the BCKS website at <*https://bcks.army.mil* > and use your AKO account to enter. Click on the Professional Forums tab on the bar across the screen, and select Participate on the left to create a BCKS account. Select the ProtectionNet forum at the left of the screen, and there you will find a forum for ArmyBaseCamp/JFOB.net.

The site currently has 13 topics that contain a lot of information on base camps. Briefings, interviews, documents, books, best practices, or policies can be placed under any one of the 13 topics. What makes this more than just a database is that real collaboration is possible. Collaboration can begin by any member starting a discussion or making a comment. Contributions can be made at any time, and uploading documents is easy. Basic administration of the website is performed by BCKS contractors, and site maintenance is performed by the Engineer School Directorate of Environmental Integration.

Promoting and advertising the system is necessary to make it well known throughout the Army, and conducting assessments is necessary to ensure that it's worthwhile and provides value. So logon to BCKS, become a member of the ArmyBaseCamp/JFOB.net professional forum, and start contributing.

Major Lindberg recently served as an instructor in the Department of Systems Engineering, United States Military Academy, at West Point, New York. He served in various engineer command and staff positions prior to his assignment at West Point and is currently attending the Intermediate-Level Education (ILE) program at Fort Leavenworth, Kansas, during the 2007–2008 academic year. He can be contacted at <travis.lindberg@us.army.mil>.

Mr. Vargesko is the Training Division chief, Directorate of Environmental Integration, United States Army Engineer School, Fort Leonard Wood, Missouri. A retired engineer officer, he is the forum leader for the ArmyBaseCamp/JFOB.net professional forum on BCKS.

Endnotes

[1]S. L. A. Marshall, *Men Against Fire: The Problem of Battle Command in Future War*, Washington: Infantry Journal; New York: William Morrow, 1947.

[2]Ronald Maier, PhD, *Knowledge Management Systems: Information and Communication Technologies for Knowledge Management*, 2d Edition, Springer-Verlag, 2004.

[3]The tasks of design, construction, operation, maintenance, and retirement are referred to collectively in this article as the base camp life cycle.

[4]The term "base camp," although widely used, is not a doctrinal term. Some of the corresponding (and also frequently used) doctrinal terms for a base camp are forward operating base, forward operating site, intermediate staging base, and contingency operating base.

Photo by First Lieutenant Kenya Virginia Saenz

International Engineers Work Together in Afghanistan

By First Lieutenant Kenya Virginia Saenz

Afghans and multinational forces are working hand-in-hand on a variety of expansion construction projects for Forward Operating Base Sharana in Afghanistan. Soldiers from Task Force Pacemaker, Headquarters Support Company, are not only engaged in supporting the 864th Engineer Battalion (Combat) (Heavy) but also manage the missions of the multinational forces. Soldiers from the 864th; the 1st Construction Company, Korean Engineering Group; and the Polish 1st Engineer Brigade are teaming to construct metal building systems (K-Span buildings), roads, ditches, culverts, and sewage lagoons.

The Polish engineers provide additional leadership and manpower to multiple horizontal construction projects and are improving the roads by ensuring that proper drainage and sewage structures are constructed before the rainy season begins. Although they didn't know what to expect or what missions they would perform, their leaders stated that working with multinational forces has been a great experience. According to their commander, he learned different training techniques from the American Soldiers, compared them to their own techniques, then used the technique that worked best to accomplish the mission. The Polish army has been deployed in places such as Lebanon, Syria, and Africa to support many humanitarian missions since the War on Terror began in 2001.

The Korean engineers focus on K-Span construction. They are especially meticulous

Photo by First Lieutenant Kenya Virginia Saenz

A Polish engineer completes the final touches on a culvert as a scoop loader hauls away the rest of the dirt.

Photo by First Lieutenant Kenya Virginia Saenz

A Korean engineer welds a K-Span building that will support the expansion of the forward operating base.

Photo by First Lieutenant Kenya Virginia Saenz

Polish soldiers work on a culvert that will prevent flooding during the next rainy season.

and brought a vertical construction capability that the task force does not have. Once completed, the K-Span buildings will enhance maintenance operations and provide more space for supply support activity. Even though K-Span buildings are not common in Korea, the soldiers had been trained by civil engineers in their country. Their main goal was to bring proper engineering assets for future coalition forces. Even with the challenges of the language gap and different working systems, the construction progress and the relationship with multinational forces is going well.

The addition of Polish and Korean engineers, along with Afghan contractors, gave the task force a tremendous capability that it normally would not have—engineers of four nationalities working together toward a common goal. In addition, common understanding and respect for safe operations kept them accident-free despite the communication difficulties.

First Lieutenant Saenz is the public affairs officer for Task Force Pacemaker, 864th Engineer Battalion (Combat) (Heavy), from Fort Lewis, Washington.

Developing Adaptive Leaders for Full-Spectrum Operations:

The Engineer Captains Career Course

By Major John N. Carey

"The essential thing is action. Action has three stages: the decision borne of thought, the order or preparation for execution, and the execution itself. All three stages are governed by the will. The will is rooted in character, and for the man of action, character is of more critical importance than intellect. Intellect without will is worthless, will without intellect is dangerous."[1]

—General Hans von Seeckt

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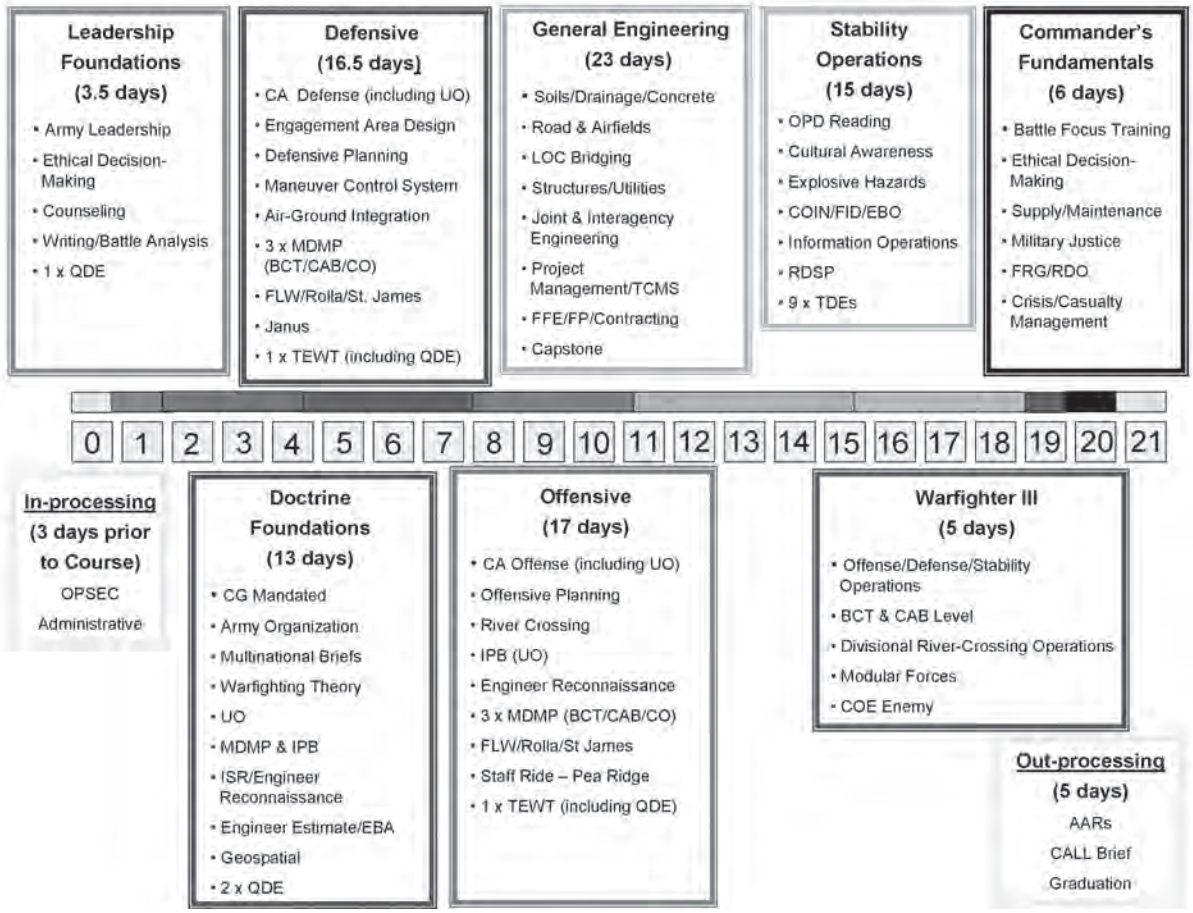
Success in full-spectrum operations requires several things: resourcefulness, knowing the enemy, determination, and leadership. From a training perspective, the challenge is to infuse these interdependent attributes into future commanders. How do we develop officers to be adaptable, creative, and intuitive? The Engineer Captains Career Course (ECCC) Division at the United States Army Engineer School, Fort Leonard Wood, Missouri, provides military education for full-spectrum operations (see figure, page 20). This article provides an overview of the current structure of the ECCC and how it develops captains for the contemporary operating environment (COE). We believe we are developing engineer commanders who are better prepared for the fight.

During the 21-week ECCC, the focus is always on quality and the individual. The teaching of doctrine emerges in an environment where "ideas are discovered and shared, not invented and arbitrarily imposed."[2] The course encourages systemic thinking, emphasizing the "whole" over the "parts." Students are taught how to think and are encouraged to experiment with doctrine, task organization, and decision-making strategies. The staff introduces warfighting theories using case studies from history and insists that students understand the maneuverist approach. Complex learning scenarios based on the modular force construct are volatile, indecisive, and ambiguous, ensuring that students attack the enemy's will to fight rather than just his physical ability to fight. Key objectives emphasized during the training include prompt analytical and intuitive decision-making, the ability to present clear verbal orders, the appropriate use of terrain, technical competence, independent initiative, and the ability to deal with uncertainty.

Changes in the course's subject material include greater emphasis on urban operations (UO), foreign internal defense (FID), counterinsurgency (COIN), information operations, and air-ground integration. The instruction was developed in coordination with the Maneuver Captains Career Course at Fort Benning, Georgia, to ensure that engineer officers can "talk the talk" in a combined arms (CA) environment. Students receive one day of media awareness training with professional civilian journalists and university interns. They continue to receive instruction on explosive hazards management from the Counter Explosive Hazards Center at Fort Leonard Wood. General engineering instruction remains at a technical level, but focuses on subjects relevant to engineer captains. Training includes base camp design; tele-engineering; project management; contracting; force protection (FP); infrastructure reconnaissance; field force engineering (FFE); and joint, coalition, and interagency operations. The use of war games and simulation has increased. Students fight a battle on the Janus combat simulation

Engineer Captains Career Course



Legend:

BCT	=	brigade combat team
CAB	=	combned arms battalion
CG	=	commanding general
CALL	=	Center for Army Lessons Learned
CO	=	company
EBA	=	engineer battlefield assessment
EBO	=	effects-based operations
FLW	=	Fort Leonard Wood
FRG	=	family readiness group
IPB	=	intelligence preparation of the battlefield
ISR	=	intelligence, surveillance, and reconnaissance
LOC	=	line of communication
OPD	=	officer professional development
OPSEC	=	operational security
RDO	=	rear detail operations
TCMS	=	Theater Construction Management System
TDE	=	tactical decision-making exercise

program, receive focused feedback, and immediately fight the same battle again. Throughout this deliberate practice, students are actively coached by senior mentors.

The course promotes critical thinking by allowing students to examine different approaches and solutions to tactical problems without the fear of being criticized or ostracized. Throughout the training, they complete a professional reading program across the spectrum of operations. They brief peers and instructors on their findings and must be prepared to answer questions. Generic cultural awareness training and ethical decision-making includes historical case studies; quick-decision exercises (QDE); and visiting lecturers, including civilians and international officers. This is reinforced with daily briefings on current affairs and read-ahead discussions. Students also complete unscheduled quizzes, capstone events, and multifaceted final exams.

Students are encouraged to study military history to develop a greater understanding of the military art. Each module is introduced using historical examples, and instructors use vignettes to demonstrate the practical application of theories.

Students are required to research historical battles and develop a thesis. The best academic paper for each course will be submitted to the Engineer Professional Bulletin <*www.wood.army.mil/engrmag/default/htm*> for publication. The students attend a two-day staff ride to expand their technical knowledge and support professional and personal growth. They conduct site visits and terrain walks to develop their awareness. Lessons learned from combat are rapidly included in training to ensure the relevance and currency of the subject matter.

Training media to develop adaptive thinking are diverse and include model and map exercises, QDEs, and tactical-decision games. These test the students' decision-making abilities in a time- and information-constrained environment. Examples include search, raid, quick-reaction force, and route clearance missions. With training such as river-crossing operations, students experience the problem first and learn the theory afterward. This ensures that the students have some understanding of the operation to reflect on before they receive the formal instruction.

During the appreciation process, the officers use troop-leading procedures; mission, enemy, terrain, troops, time available, and civilian considerations (METT-TC); the military decision-making process (MDMP); and the rapid decision-making and synchronization process (RDSP). They are introduced to international methods such as "The Seven Questions," from the British Army, and the "Combat Military Appreciation Process," from the Australian Army. Students also conduct tactical exercises without troops (TEWTs), which involve examining a tactical problem, conducting an appreciation, and producing a solution for the ground where the problem is set. The practical application of the plan is emphasized. Assessment is based on whether the student made a timely decision in keeping with the commander's intent and the changing situation. Problems and terrain are selected to encourage discussion and highlight selected issues.

Professional mastery is built on constant training, peer and instructor feedback, and assessment. Everyone, including cadre, receives evaluations. Senior mentors support instructors by providing guidance and effective feedback that focus on adaptive thinking, innovation, and outcomes rather than on performance to standard. The small-group leader performs the role of instructor, coach, and mentor, determining when each role is required and should take primacy in the relationship with each student. Physical fitness is stressed and greatly improved. Students conduct combatives training and plan and execute physical training schedules for their team. Rigorous self-examination is encouraged through command philosophy development, effective counseling, after-action reviews (AARs), media awareness training, and vigorous and open debate.

Finally, the course leverages technology—particularly distributed learning techniques—using the Blackboard Learning System™. The Engineer Leader Smart Book and a community site for alumni have also been developed in coordination with training developers to ensure that course updates are available in the field. The cooperative degree program continues to be a significant aspect of the ECCC. This is an excellent opportunity for students to gain a master's degree with one of the universities that partners with the Engineer School. More importantly, the cooperative degree program fosters intellectual autonomy and confidence in reason.

"The ECCC is leading the rest in developing Army leaders for the 21st century. Recent graduates have informed instructors and training developers that they are better prepared for fighting full-spectrum operations."

The ECCC is leading the rest in developing Army leaders for the 21st century. Recent graduates have informed instructors and training developers that they are better prepared for fighting full-spectrum operations. They are able to look at a problem from various perspectives, assess the risks, and make timely decisions. The recent changes in the course address the gaps in mental agility and tactical and technical proficiency. The ECCC teaches students *how* to think, not *what* to think, and encourages future commanders to dedicate themselves to lifelong learning.

Major Carey, a member of the Australian Army, is the Division Chief, Engineer Captains Career Course, at the United States Army Engineer School, Fort Leonard Wood, Missouri. He has experience in providing engineer support to jungle, airmobile, and amphibious operations. He has commanded an engineer squadron in East Timor, taught tactics at the Royal School of Military Engineering in the United Kingdom, and served as an adviser on peace operations in Israel, Jordan, and Bougainville. He is a graduate of the Australian Defence Force Academy; the Royal Military College, Duntroon; and the Australian Command and Staff College.

Endnotes

1 Hans Von Seeckt, *Thoughts of a Soldier,* E. Benn Ltd., Berlin, 1930.

2 Major Don Vandergriff, "Raising the Bar – Creating Adaptive Leaders to Deal With the Changing Face of War" at *<http://www.d-n-i.net/vandergriff/rotc/rotc.htm>*.

Leadership: A Personal Viewpoint

By Lieutenant Colonel Wayne Larry Dandridge (Retired)

Leadership is taking the point position when your unit or flight is expecting contact with the enemy. Leadership is flying a crippled bomber to the ground when one of your wounded crewmembers cannot bail out. Leadership is keeping your young Soldiers, Marines, Airmen, Sailors, and Coast Guardsmen alive and never leaving your wounded behind. Leadership is writing a dead trooper's family a personal letter immediately after the battle.

Leadership is not glorifying war. Leadership is not doing "anything" just to get promoted. Leadership is not winning the battle at all costs, nor is it losing a war to avoid casualties. Leadership is not found in the security of a well-fortified command bunker, nor is it found in a plush officers' field mess.

No compromise of the integrity of one's word, deed, or signature is leadership. Setting high standards and seeing that they are met is leadership. Intelligence, dedication, creativity, and selflessness are leadership. Stamina, vigor, and commitment are leadership. Spontaneous, contagious enthusiasm is leadership. Initiative, self-improvement, and professionalism are leadership.

Leadership is rewarding a Soldier, Sailor, Airman, Marine, Coast Guardsman, or Civilian with the appropriate recognition immediately after exceptional service. Leadership is commanding and managing. Leadership is establishing and meeting, by priority, specific objectives. Leadership is managing by exception, using job enlargement, and seeking job enrichment.

Believing in God, family, and country—in that order—is leadership. Being humanistic is leadership. Trusting the ideas and decisions of well-trained troops is leadership. Knowing where the mission is, when the troops and material are to be there, and how many troops and systems are needed to win is leadership. Blocking out periods of "private time" to accomplish creative work and recharge is leadership.

Leadership is treating men and women equally without regard to race, color, creed, religion, age, or custom. Leadership is visiting your wounded and sick frequently. Leadership is knowing and living by the Constitution, the Code of Conduct, the Geneva Convention, and the basic human rights of all mankind. A leader is assertive, but not aggressive. Leadership is neither ruthless nor mindless discipline, but the ability to do the right thing at the right time, by putting the whole before the parts. Leadership is not a good efficiency report, nor is it paper readiness. Leadership is not a court martial for every mistake or leniency for serious violations. A leader is fair, predictable, and consistent.

Giving sound professional advice to a superior, even when you know he or she does not want to hear it, is leadership. After you have given your best advice, following all legal, moral, and ethical orders—even when you do not agree with them—is leadership. Leading when you can, following when you should, and getting out of the way when you have nothing to offer is leadership. Learning the language, culture, and customs of a host country is leadership. Staying in top physical condition is leadership.

Leadership is a general who knows the friendly and enemy situation, knows the immediate action sequence for the M16 rifle, knows his driver's first name and family, and can recite the Lord's Prayer. Leadership is a private who knows that he or she is in the chain of command and may have to take over when senior in rank. Leadership is knowing that a water truck in the desert is worth more combat power that an extra-armored cavalry regiment.

Not forgetting that the past is our heritage, the present is our challenge, and the future is our responsibility is leadership. Not being overweight, not smoking, saying no to drugs, and not drinking alcohol in excess is leadership. Delegating authority, commanding confidence and respect, and accepting full responsibility for your actions is leadership. Ingenuity, sociability, tact, and tenacity are leadership. Cross training is leadership.

Leadership is not being right all the time, and it is certainly not being wrong most of the time. Leadership fixes problems—not blame. Leadership is adaptability, appearance, cooperation, and decisiveness. Leadership displays knowledge, manages resources efficiently, and plans beyond the immediate requirements of assigned duties. Leadership creates an organization of mutual respect. Leadership is building an organization and environment where it is not necessary to tell troops what to do. Leadership knows that combat without conscience is evil.

A leader knows why there are air, land, and sea forces; why there are cavalry, infantry, armor, artillery, aviation, amphibious, special operations, pre-positioned, recon, and logistical forces; and why combined arms and concentration of combat power are important. A leader knows about net-centric warfare and defense in depth, civil affairs, urban operations, the advantages our forces have at night, and how to use them. A wise leader knows that young Soldiers spend most of their time worrying about and planning tactics, while older more experienced Soldiers spend the majority of their time worrying about planning logistics.

Photo courtesy of U.S. Army

"Leaders know about the need to wage 'total war' to win and the special advantage the defender has in cities, mountains, and jungles." (Combat engineers with Special Troops Battalion, 2d Brigade Combat Team, 82d Airborne Division, prepare to enter and clear an "enemy" compound during an exercise.)

Leadership can be good or bad, centralized or decentralized, warm or cold, offensive or defensive, macro or micro, expensive or free. Leadership can be Catholic or Protestant, Jewish or Moslem, Hindu or Mormon, Atheist or Agnostic. Leadership prevents overmobility of junior leaders and troops, by keeping them in their jobs long enough to really learn their jobs and common and collective tasks and to work as team members. Establishing and promoting worker and troop certification and team certification programs are leadership.

Leaders hope and pray for the best and plan for the worst. Leaders know about the need to wage "total war" to win and the special advantage the defender has in cities, mountains, and jungles. Leaders know how to "own the night" and take maximum advantage of all of the combat arms team and are skilled in the use of snipers, attack helicopters, counter artillery, naval gun/missile fire, and close air support. Leaders know not to keep troop weapons locked up and away from them, but rather train troops to live with a clean weapon that they are an expert with.

Leadership is embodied in Martin Luther King Jr., Abraham Lincoln, Pope John Paul II, Robert E. Lee, Mohammed, Irwin Rommel, Jesus, Joan of Arc, John Paul Jones, Winston Churchill, Sister Teresa, Margaret Thatcher, and many other well-known figures. Leaders are also Robert Lightle, J.C. Dandridge, Sam Deloach, Bubba Segrest, Lee Thompson, Val Berger, Earl Erickson, Luther Bergen, Judi Dandridge, Rick Maull, and thousands of other unknowns.

Commitment to the team and a participatory form of leadership that draws on every troop's knowledge and skills—at every level—is leadership. Encouraging and rewarding suggestions and complaints is leadership. Having an "open door" and "open mind" policy is leadership. Empowering troops, civil service employees, and support contractors with the tools, responsibility, authority, and "accountability" to get the tough jobs done is leadership. Making troops multiprocess, multiweapon, and multifunctional experts is good leadership. Good leaders practice servant leadership.

Leaders know that "the bitterness of low quality remains long after the sweetness of low price." Leaders allow talented soldiers "long tethers" for experimenting. Leaders find ways to satisfy the essential dualism of troops and civil servants to be both part of a team and be recognized as individuals. Leaders know how to use "internal and external benchmarking," observations, and inspections to rate their organization's readiness, products, services, and processes against those front-runners in their specialty.

Leadership is guiding. Leadership is legendary. Leadership is foresight. Leadership is absorbent, abstinent and, unfortunately, at times it is abominable. Leadership is baccalaureate, balance, basic, and too frequently backward and barbaric. Leadership has saved lives, killed, stopped wars, and started wars. Leadership has walked softly and carried a big stick, but it has also been loud and nonviolent.

Saying what you do (in clear, concise standard operating procedures, plans, and operations orders) and doing what you say is leadership. Breaking down communication barriers between staffs, line units, support organizations, and sister units is leadership. Asking deep probing questions and finding root causes is leadership. Changing problems into

opportunities is leadership. Knowing that you can seldom wait until you have all of the answers is leadership. Repeatedly doing simple things that demonstrate sincerity is leadership.

Leadership is honesty, enthusiasm, loyalty, courage, and wisdom. Taking care of your Soldier's, Civilians, Sailors, Airmen, Coast Guardsmen, and Marines and their dependents is leadership. Leadership includes being a good boss, comrade and friend, father or mother, son or daughter, sister or brother, and husband or wife. Knowing that the profession of arms is much more than just a job is leadership.

Being an unquestionable friend to the environment is leadership. Basing decisions on facts is leadership. Promoting and rewarding continuous improvement is leadership. Being a champion of safety and quality is leadership. Staying focused on internal customers, external customers, and the enemy is leadership. Performing preventive maintenance, knowing what cellular techniques involve, being skilled in setup reduction, understanding mixed-model methods, understanding rocks-in-the river inventory management, knowing how to level and balance workload, understanding that distance (to supplies, replacements, ammunition, fuel, etc.) is usually evil, and ensuring that things are at least "in time," not "just in time."

Leadership is enthusiasm, optimism, helping, training, encouraging, understanding, motivating, disciplining, crying, laughing, standing firm, giving way, counseling, correcting, giving a second chance, and trying again and again. Leaders are tall, short, thin, heavy, male, female, black, brown, white, yellow, old, young, and naturalized and unnaturalized. Leaders are from the city and from the farm. Leadership works hard to close the gap between the potential and the performance of a Soldier.

Knowing how to use teams, flow charts, simple—yet powerful—statistical methods, simplification, continuous improvement, complaint and suggestion programs, and standardization to get the tough jobs done is leadership. Leadership makes quality easy to see, feel, smell, taste, and hear, by finding root causes and permanently fixing the problem. Leadership is clarifying processes, flow-charting complex processes, and making every troop an expert at Soldier common tasks—everyone should be an infantryman first!

Leadership is caring, compassion, understanding, and leading by example. Leaders look you in the eye, kick you in the butt, cover your flank, and take your place on the most dangerous mission. Knowing there is "a place for everything and everything in its place" is leadership. Leadership is admitting mistakes and learning from them. Eating last is leadership. Practicing servant leadership and sharing the pains of heat, dirt, sand, cold, wet, insects, and other harsh environmental conditions is leadership. "Packing your own roll and digging your own hole" is leadership.

Leadership comes from experience, but experience comes from making mistakes. A leader changes the odds and knows the risks. Leaders develop teamwork. The tides, the channels, the seasons, the winds, the hazards, the weather, and the best forecasts are all known by leaders. Leadership knows that the one most important word is "we" and the least most important word is "I." Leadership knows there is no end to change, except failure. Leadership knows that if you treat every customer like your last or first, you will never have to worry about repeat business.

Leaders often make good grades in school and have many years of formal education and numerous important degrees. But they also have been known to fail math, English, and other equally important subjects. Leaders make sure the enemy gives his life for his cause. Leaders ensure that their troops always have the tactical advantage, the best training and equipment, and the highest morale, as well as plenty of water and hot food. Leaders work hard at ensuring that the workload is distributed equally among all troops.

Leadership comes from family, friends, teachers, coaches, and pastors. Simple, easy-to-understand orders come from leaders. Complex tasks are changed into short and accurate plans through leadership. Leadership can be learned and taught, but it cannot be forgotten nor bought. Leadership can be seen, tasted, smelled, felt, and heard, and it can come from a blind person with no hands who cannot hear, speak, or walk.

Finally, a leader is so in love with life that he or she is willing to die to ensure that others' lives—and our great nation—will go on!

Lieutenant Colonel Dandridge (Retired) is a certified Business Process Reengineering Specialist as well as the East Region Manager and a Senior Engineer with WESTAR Aerospace and Defense Group, Incorporated, Field Services Division, and the CEO of CLC Hospice, LLC. He is an Army ex-enlisted infantryman; ex-aviation warrant officer; combat attack, utility, and scout helicopter pilot; fixed-wing pilot; flight examiner; instructor pilot; and a retired Army Master Aviator. An FAA-certified flight instructor in airplanes, helicopters, instruments, and basic ground, he has worked as a multi- and single-engine commercial pilot. A graduate of the Armed Forces Staff College, he holds a bachelor's in aeronautical science and a master's in transportation management. Lieutenant Colonel Dandridge, a member of the West Point Logistics Hall of Fame, has had professional articles published in more than 16 U.S., German, and British professional journals, magazines, and newspapers.

Note: Beginning with this issue, *Engineer* will include an article from a previous issue of the bulletin, which has published continuously since the premiere issue in Spring 1971. When Lieutenant Colonel Dandridge recently submitted this article—an update of one that was selected as the first of a new feature called *A Personal Viewpoint* in the Winter 1983-84 issue, it seemed like an appropriate first article for our new feature called *From the Archives*.

SAVING THE ARMY TIME AND MONEY

By Lieutenant Colonel Bradley A. Duffey

In a growing military community like Grafenwoehr, Germany, balancing housing and community needs with training requirements is complex. Sometimes, ensuring that both areas of need are covered requires some out-of-the-box thinking.

Back in March 2007, the 7th United States Army Joint Multinational Training Command (JMTC) Safety Office had no choice but to shut down a critical ammunition holding area because it was too close to new housing construction. Without the use of that holding area, units training at Grafenwoehr would feel the impact immediately. Faced with an already demanding and rapidly increasing operations tempo, JMTC began sorting options to resolve the issue. There were three possible avenues to be evaluated:

- The first option—contract development of a new ammunition holding area—was quickly ruled out. The contracting process would be too time-consuming and would directly impact operations on the ranges and training sites. A faster solution was needed.
- The second option was to negotiate with the German government, which was willing to allow continued use of the holding area, but at greatly reduced tonnage. That would also impact operations and slow down training for the units as they took valuable time to readjust ammunition receiving and distribution plans instead of putting rounds downrange.
- The third option, which JMTC chose, was to request that Army National Guard engineer assets come to Grafenwoehr for overseas duty training, with a goal of having the new site built within 21 days. With that plan in hand, the command invited the 631st Engineer Company from Lawrenceville, Illinois, to train at Grafenwoehr. This mission closely resembles combat operations in Iraq or Afghanistan, since units in both places are working similar issues regarding ammunition holding area construction. As the theater matures and neighborhoods in such places as Balad and Baghdad improve, ammunition holding areas will ultimately have to be moved and rebuilt.

JMTC still faced another problem—money. Fiscal year 2007 funds were earmarked, and even though bringing in National Guard Soldiers for construction saved the Army nearly $185,000, still more dollars needed to be saved. Time and dollars were both tight, and it would take lots of both to bring the unit to Germany, conduct a reconnaissance, obtain data, return home, and then prepare to deploy to Germany for

Soldiers from the 631st Engineer Company build concrete walls for the ammunition holding area.

The Soldiers begin site preparation and conduct new operator training.

the mission. To offset some of these costs, the United States Army Corps of Engineers® (USACE), Europe District, was called for design assistance. The chief of operations, plans, and security for the district sent a forward engineer support team-advanced (FEST-A) to Grafenwoehr to conduct the site plan survey.

This mission was a great training opportunity and the type of mission the FEST-A was designed to accomplish. The team, combined with reachback support, provided a great resource. The team conducted an area assessment, compiling data and sending it to the USACE TeleEngineering Operations Center in Vicksburg, Mississippi. The center analyzed the data and forwarded the mission to the USACE Ordnance and Explosives Center of Expertise in Huntsville, Alabama. There, using the data from Grafenwoehr and analysis from Vicksburg, experts in the explosives storage field were able to create a design, develop a scope of work, and determine the bill of materials needed. JMTC used the design to coordinate with the 631st and determine the number of personnel and amount of equipment needed for the project. The design created was used as the centerpiece of the master plan to execute the mission.

Faced with a limited budget, JMTC had to phase in the project over two years. The minimum standards for an operational ammunition holding area were gravel pads, protective berms, and lightning protection poles. The engineers had to be creative with the design of the berms in order to save money on fill material. There were three variations of the berm, but the design agreed on by agencies within JMTC was the one that saved the most amount of fill, thus saving more money.

Because of other construction projects in the JMTC area of responsibility, equipment was limited. The 631st had the following assets for the construction project:

- (1) Roller
- (2) 2½-yard scoop loaders
- (1) 917 dump truck
- (1) 5-ton dump truck
- (2) D7 dozers
- (1) Grader
- (1) Small Emplacement Excavator (SEE)

The purpose of the overseas deployment training was not only to augment the Active Army in mission accomplishment but also to allow the unit to think outside the box and work around its own strengths and weaknesses to complete the mission. Unit leaders received a cookie-cutter Program Evaluation Review Technique (PERT) chart as guidance; however, the unit had to shape the project chart for rain delays and equipment deadlines. For instance, the 631st spent an entire day analyzing the terrain for grading activities because increased grading and dozer activities would eventually change the direction and flow of rainwater on the site. As a result, an extra day was planned to improve drainage. Also, the unit leadership decided to sequence construction activities so fill material was not exposed to excessive rainwater for long periods of time.

The 631st encountered several other minor problems that caused it to think outside the box to find a feasible solution to

Army National Guard Soldiers from the 631st Engineer Company install a lightning protection pole next to a pad for the ammunition holding area.

meet the standards of the mission. For instance, the unit had a D7 dozer that was not running at full capacity. To prevent pushing it to its limits and hastening a deadline status, the dozer was used in its limited capacity as a D5. This limited the D7's production, but having the extra lag time was worth more than losing the dozer to maintenance downtime. The company constrained the project by choosing the activities that had the most total float, such as berm construction.

The 631st also had to conduct a concrete mission for this project. The unit received support from three members of the 368th Engineer Battalion (Combat) (Heavy) from Londonderry, New Hampshire, who provided oversight for the form construction and concrete installation. After the concrete was poured on the first pad site, members of the 631st completed the rest of the concrete work needed for the pads. An added feature to the concrete edging was metal bands installed inside the formwork to connect to the lightning protection poles.

New lightning protection poles were not going to arrive until long after the 631st had returned home. Faced with not being able to use the ammunition holding area until late August, the decision was made to salvage the poles from the old site and develop a workable plan. However, the lightning protection poles ordered to specification were taller and had two loops at 90-degree angles for feeding wire cable through to connect the poles. The 631st adapted the plan by turning the existing poles so that the single loop faced into the pad at a 45-degree angle, allowing the cables running around the top to be connected to each pole by one loop instead of two.

After the 631st installed lightning protection poles and grounding wires to the first pad with the concrete edging, the Grafenwoehr Department of Public Works came to the site and conducted an ohm test. The test results were well within the acceptable range. It is necessary for the pad to have less than 10 ohms, since more than that would require additional grounding rods placed below the pad.

As time constraints became a larger issue and materials in the original design were not going to be available for the unit to complete the project as originally designed, the 631st broke the plans down into mission-essential elements and nonessential elements. If the unit found that a nonessential element was going to delay the completion of the project, the Soldiers developed alternate courses of action that achieved the same end state. The ingenuity of the Soldiers from the 631st Engineer Company kept the project under budget and on time. And of equal importance, maneuver training went ahead seamlessly, without interruption.

Lieutenant Colonel Duffey is the Reserve Component Liaison Officer and Troop Construction Officer in Charge for the 7th United States Army Joint Multinational Training Command, Grafenwoehr, Germany. His past assignments include Operations Officer, Facility Engineer, for Headquarters, 416th Engineer Command, and Operations Officer, Battle Projection Group, for the 1st Simulation Exercise Group, 75th Division. He holds a bachelor's from the University of Central Oklahoma in Edmond, Oklahoma, and a master's from Central Michigan University in Mount Pleasant, Michigan.

Engineer Dog Handler Honored

By Captain Erik Karstensen and Mr.Luke Waack

On 4 December 2007, the Army's newest and most modern veterinary hospital and military working dog kennel, located at Fort Leonard Wood, Missouri, was dedicated to a fallen Soldier, Corporal (CPL) Kory D. Wiens. A member of the 94th Engineer Detachment (Canine), 5th Engineer Battalion, 1st Engineer Brigade, Fort Leonard Wood, CPL Wiens and his specialized search dog, Cooper, were killed in July by an improvised explosive device (IED) while on patrol near Baghdad. They had been in Iraq since January.

CPL Kory D. Wiens and his specialized search dog, Cooper

Dozens of family members, friends, and Soldiers attended the dedication ceremony, and the memory of CPL Wiens was honored with words, song, and actions. Brigadier General (BG) Gregg F. Martin, United States Army Engineer School commandant, addressed the Wiens family directly, saying, "We will never forget your son. We will always remember him as the great Soldier and the great person that he was."

Singer-songwriter Murray Weinstock, who has worked with many many well-known recording artists, performed his song "War Dogs," which he wrote after seeing a documentary that highlighted the special relationship that exists between these beloved canines and their military handlers. To quote the song, "A bond is built forever, forever and a day; built on love, built on trust, that's the K-9 way."

An oil painting depicting CPL Wiens and Cooper was dedi-cated to the facility by military artist Chief Warrant Officer 2 (CW2) William Smock, who also presented a watercolor version of the portrait to the Wiens family. An Indiana National Guardsman, CW2 Smock has painted many scenes from his deployment to Iraq. And in May 2007, he presented a portrait of engineer Medal of Honor winner Sergeant First Class Paul R. Smith when Fort Leonard Wood's new Counter Explosive Hazards Center (CEHC) was dedicated to the fallen hero (see *Engineer*, April-June 2007, page 24).

Engineer Soldiers stand at parade rest during the dedication of the Kory D. Wiens Veterinary Hospital and Kennel.

The new kennel training facility—a part of the CEHC—will be home to the Engineer Regiment's Forces Command (FORSCOM) Canine Company. This company, which has grown since its inception in 2003, has become the most constantly deployed unit in the Regiment, with K9 elements deployed continuously to Operation Enduring Freedom since 2003 and Operation Iraqi Freedom since 2004. The Soldiers and canines involved in these deployments provided the Army mine detection and specialized search capabilities that have saved the lives of countless coalition forces. These symbiotic teams of Soldiers and canines develop phenomenal capabilities to detect

weapons, ammunition, and explosives and are an essential element to fighting the War on Terror.

The CPL Kory D. Wiens Veterinary Hospital and Dog Kennel will provide state-of-the-art facilities to support the training of current and future engineer dog teams. The facility provides 36 new kennel runs for these vital assets. This increased capacity, which makes it the largest FORSCOM kennel and second largest kennel in the Department of Defense, allows the teams to better support both the War on Terror and missions closer to home. (The largest kennel is the Department of Defense Military Working Dog Center at Lackland Air Force Base, Texas.)

The kennel runs are almost as large as a single Soldier's room, providing the working dogs plenty of room to move about. Additionally, the offices in the kennel provide a state-of-the-art working environment, which significantly enhances the Canine Company's operations. The facility helps create a collocated synergy between handlers, kennel masters, and the chain of command.

And lastly, the collocation of the veterinary hospital with the kennel is a tremendous benefit to the military working dog (MWD) program. This regional hospital is not only responsible for the health of engineer MWDs but also for MWDs of military police and other branches of service as well, to include those on surrounding forts and bases.

This oil painting depicting Corporal Wiens and Cooper was dedicated to the facility by military artist CW2 William Smock.

During the ceremony, BG Gregg Martin presents Mr. Wiens with a rememberance plaque of his son, Corporal Kory D. Wiens.

The hospital—which will provide both routine and emergency care—has an intensive care unit, a full laboratory, and modern x-ray equipment, along with a fully enhanced surgery suite. It will ensure that the MWDs receive the best care available to keep them at their fighting best. With the veterinarian hospital being collocated with the kennel, engineers can cross-train with the Veterinary Corps to learn valuable medical skills to better care for the working dogs while deployed on missions. It will also enable military occupational specialty (MOS) 68T animal care specialists to further enhance their skills and proficiency in the hospital environment, as well as the combat environment.

CPL Wiens, who was dedicated to the MWD program, was named Kory after his grandfather, a canine handler in the Korean War. CPL Wiens and Cooper, a Labrador retriever, were the first MWD team killed in action together since the beginning of the wars in Iraq and Afghanistan. They were buried together in CPL Wiens' hometown in Oregon.

Captain Karstensen is the commander of the FORSCOM Engineer Canine Company.

Mr. Waack, a writer for the Fort Leonard Wood newspaper, the Guidon, since October 2007, was a Soldier and broadcast journalist from 2001-2006. His last duty assignment was at the American Forces Network in Vicenza, Italy.

Katrina Lessons Leave LSU Safer

By Dr. JoAnne Castagna

As students begin a new semester at Louisiana State University (LSU) at Baton Rouge, the school—with the help of the United States Army Corps of Engineers® (USACE)—takes a new approach to keep its college community safe from future hurricanes. The region recently marked the second anniversary of Hurricane Katrina, the sixth-strongest Atlantic hurricane ever recorded and the third-strongest hurricane on record to make landfall in the United States. USACE continues to deploy thousands of personnel to the Gulf Coast to assist the Federal Emergency Management Agency (FEMA) and other federal, state, and volunteer organizations in getting the beaten region back on its feet. One of the ways USACE is helping is through Geographic Information System (GIS) support.

A GIS expert with the New York District of USACE is one of four national action officers responsible for deploying and managing GIS teams throughout the Gulf region. He explained that GIS is a computer-based information system and tool for analysis of spatial data. It takes data from various sources—such as aerial photographs, drawings, and electronic geographic data—and combines these layers of information as overlays to perform spatial analysis and produce an electronic map that depicts the results of that analysis.

Map by Roger W. Porzig, Jacksonville District, USACE

Louisiana State University at Baton Rouge

USACE is using the GIS to help make LSU a disaster-resistant school. Even though the school wasn't damaged by Katrina, the campus is still vulnerable to future hurricanes since it is located in the southern part of Baton Rouge, bordered on the west by the Mississippi River. Louisiana is a coastal state that faces threats from hurricanes and tropical storms year-round, but especially during hurricane season. Katrina was a Category 5 storm that left death and destruction along its path. Since last year, USACE has been working with the university to map the entire school into the GIS. If a hurricane occurs, the school administration will have maps electronically available to help guide them through the situation and save lives of thousands of students and staff.

Photo by Brad Mooney, FEMA

A USACE/LSU team maps out the university campus using GIS technology.

The main function of the GIS-based maps is to reduce the time it takes for emergency personnel to assess a given situation. LSU wanted to get its entire 2,000-acre campus into the GIS, including all of its buildings, parking lots, sidewalks, and roads. Building information was linked to the school's safety database, including building names, number of rooms, classroom numbers and layouts, square footage, and professors' names and telephone numbers. If an emergency occurs in a particular building, school staff members can pull up the GIS map, click on the building to see where emergency exits and fire

Photo by Jim Zietz, LSU Public Affairs

The Pete Maravich Assembly Center, a large indoor basketball arena, was used as a medical special needs shelter in the aftermath of Hurricane Katrina.

extinguishers are located, and access contact information for professors or other personnel who are normally in that area of the campus. If a certain portion of a building is damaged, the GIS information can provide an idea of who may be trapped or in danger.

A spokesman for the university police said that the GIS will make LSU an "active campus" that will give important data about facilities. For example, if there is a fire in a laboratory, officials can click on that room, see what chemicals are stored there, and pass the information to the fire department. The Pete Maravich Assembly Center, a large indoor basketball arena, served as a medical shelter for New Orleans residents with medical special needs in the aftermath of Katrina. Now the school wants to better prepare it to serve as a medical special needs center in case another hurricane hits. Digitized drawings of the arena created electronic maps in the GIS, and the school's hospital and social services departments determined where beds, medicine, and volunteers should be placed. If the shelter is activated, employees working there will know where and how to set up the beds, where to store the medicine, and where tables are set up, so the operation will proceed smoothly. Officials will be able to assess an emergency situation more quickly with the GIS electronic-based maps than with printed maps that may be obsolete since roads, parking lots, and buildings may change over time. GIS maps can be updated with new information immediately, as opposed to printed maps that may only be updated every couple of years.

The GIS system will also serve as a basis for a 9-1-1 emergency telephone number system for the LSU campus, which is a city within a city. The GIS will also be useful in situations in which many different agencies converge on a scene. The personnel from the agencies may not know the area, so GIS maps will help them become familiar with the layout of the buildings and the campus. Before USACE developed the GIS maps for the school, campus addresses were not available and useful street data had not yet been developed. Simple package deliveries to the campus were major obstacles for the staff and faculty.

The USACE GIS team will continue to support FEMA and LSU in Baton Rouge as long as necessary.

Photo by Jim Zietz, LSU Public Affairs

The Memorial Tower is a central feature of the Louisiana State University campus.

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>.

FUELING THE FRONT LINES:
ARMY PIPELINE UNITS - PART I

By Mr. Thomas J. Petty

The United States Army's pipeline companies were developed to meet the Army's increasing reliance on the mechanized forces, which ran on gasoline, diesel, and aviation fuels. The truck, the tank, and the airplane all needed fuel to operate. Modern warfare saw the ever-increasing need to put these fuels into the theater of war in larger and larger quantities, over a more complex area. From the 5-gallon jerry can to a tank farm holding hundreds of thousands of gallons, uncontaminated fuels had to be delivered reliably and promptly in the quantities necessary to sustain the units they supplied. The pipeline companies were often up front with the invasion landing parties, to find and salvage any facility that could be used for fuel storage and distribution. Gasoline and fuel oil accounted for more than half of all the tonnage shipped overseas during World War II.[1]

World War I had seen limited need for pipeline systems. Distribution by tanker trucks and railcars and the jerry can was sufficient. After the war, the civilian petroleum industry expanded rapidly, and by the beginning of World War II a lightweight, easy-to-assemble pipeline and storage system had been designed. The system used lengths of rigid steel pipe with grooves at each end, joined by what were commonly called "Victaulic" couplings, named after the Victaulic Company of America, one of the coupling's manufacturers. Inside these couplings were rubber gaskets that sealed the joints. When hydraulic pressure was applied, it sealed the gaskets almost as securely as welding.

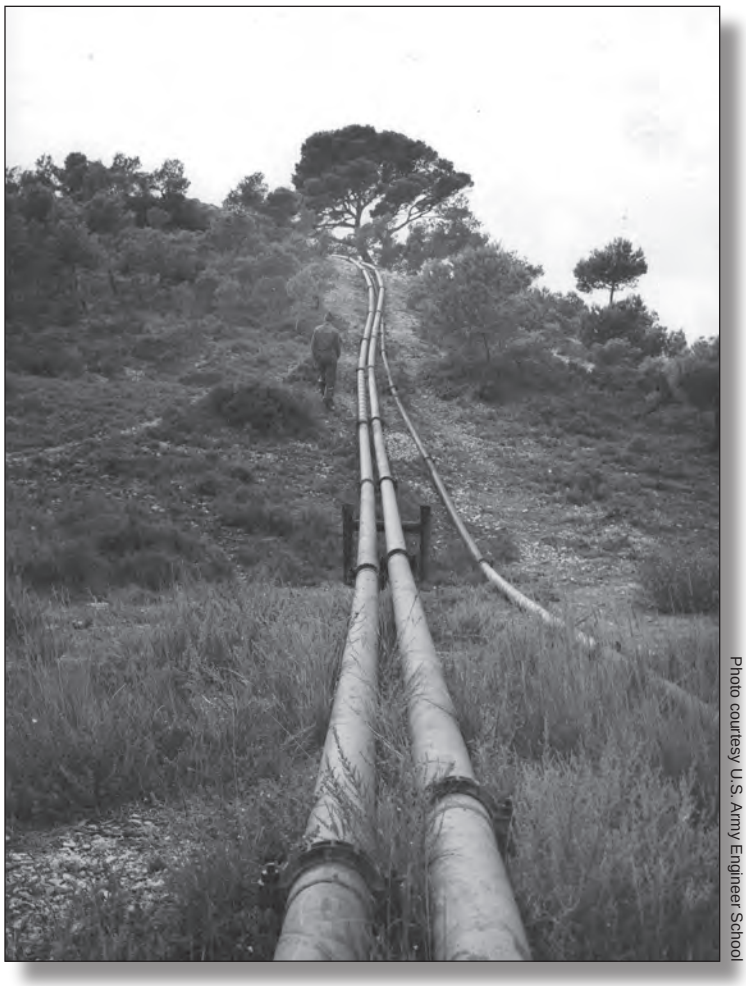


Photo courtesy U.S. Army Engineer School

The Rhône River pipeline stretched 487 miles between Marseilles and Sarrebourg, France. The line consisted of two 6-inch pipes and one 4-inch pipe. September 1945

In 1939, the Shell Oil Company offered the Quartermaster Corps (as the branch responsible for the purchase and distribution of petroleum products) an imaginative study that "contained all of the major elements of the military pipeline systems that were to be used during World War II, including lines from ship to shore, bulk storage tanks beyond the water line, and a pipeline with pumping units leading right up to the front line."[2]

The Quartermaster Corps, which was interested in using a pipeline as a way to unload fuel from ships and take it a short distance to the nearest storage facility, got approval to build a 5-mile test section of pipeline in Hydro, North Carolina, in February 1941. Results of the test—which constructed pipeline from a valley, across a river, and up a hill to a distribution point—were good. Further tests and trials soon came to the attention of the Army engineers, who wanted to string pipe from the ports to the front lines, even if the front lines were hundreds of miles away.

It was not only the Army engineers who saw the potential of this system. By the fall of 1941, the Chinese government wanted to obtain the system through the Lend-Lease Program for use along the Burma Road. A pipeline was of great interest to the Chinese since "trucks delivering gasoline over the Burma Road consumed half of their load in making the trip."[3] This pressure from the Chinese helped spur greater movement in the development of a usable and workable system. The Army engineers were asked to study this project. Brigadier General John Magruder, Chief of the Military Mission to

Photo courtesy U.S. Army Engineer School

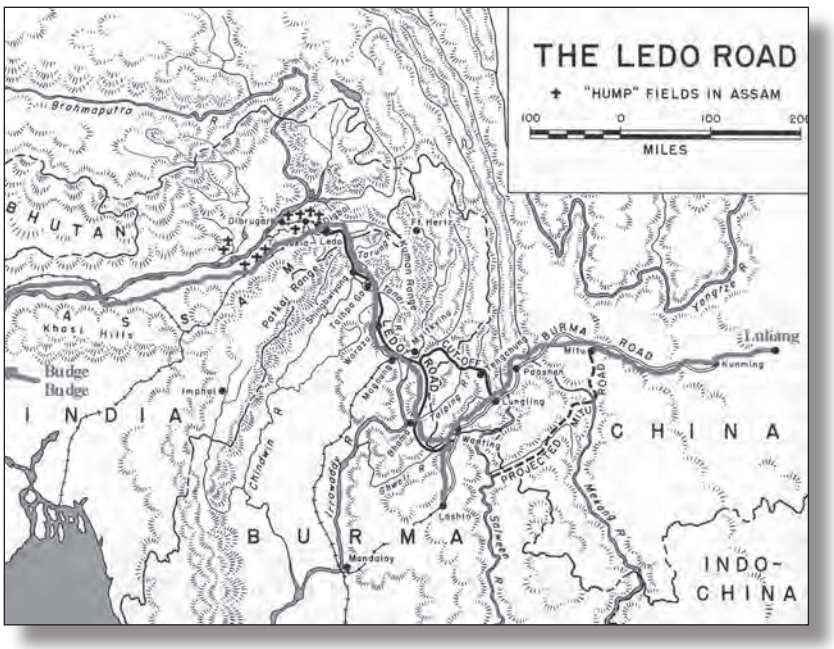
These 6-inch pipelines transported fuel from ports to the front line.

China, determined that the project would—

- Cost $5,000,000.
- Require 16,000 tons of steel.
- Include 240 possibilities of control failure and 200,000 possible points of leakage.
- Require 40 pump stations.
- Be constructed over very rugged terrain.

Brigadier General Magruder believed that the system had sufficient merit to warrant further study, but was not yet sufficiently proven to be installed.

Sid S. Smith, the Shell Oil Company representative who had designed the pipeline system, proposed laying a 30-mile line of 4-inch pipe, complete with pumps and automatic controls, as a further test of the system. This was a turning point for the military application of pipeline. A test site in the mountains of the Shenandoah National Park in Virginia was selected. Soldiers were not readily available for the project,



United States Army engineers and the Chinese army laid 2,000 miles of pipeline from Budge-Budge, India, to Luliang, China, in 15 months.

A Soldier from the 2656th Petroleum Distribution Company experiments with alternative transportation methods in Tunisia in 1943.

so workers were hired from the local civilian population. The project started on 30 June 1942 and concluded in mid-October. During this time, a lot of information was collected and problems resolved. On 8 July 1942, an unskilled crew laid 16 1/2 miles of pipe complete with pump stations in 18 days. Problems with the couplings were found and resolved. The reciprocating pumps seemed to wear out quickly, so centrifugal pumps were recommended as a solution.

At the same time, the Army engineers and the Quartermaster Corps resolved questions of control. It was decided that engineers would lay the pipeline from the ships to a point as far inland as needed and build the storage facilities and pump stations. The Quartermaster Corps would be responsible for the distribution points along the pipeline. Because the Virginia experiment was such a success, the Chinese were able to lay their pipeline along the Burma Road (and its successor, the Ledo Road). The Army engineers and the Chinese army eventually laid 2,000 miles of pipeline from Budge-Budge to Luliang in 15 months.

With the success of the Virginia experiment in mind, the Office of the Chief of Engineers ordered a short training program to begin. On 15 October 1942, two pipeline detachments were organized and began training at Fort Belvoir, Virginia. A month later, the program was moved to the Desert Training Center in the Mojave Desert so that the equipment would not need to be winterized. The program was also expanded to four pipeline detachments at this time. These first units, which were manned by Soldiers with previous oil field experience, performed extremely well overseas. By later forming the nucleus of new units, these Soldiers helped expand the program in-theater.

The first petroleum distribution company was the 696th. Manned entirely by experienced oil field personnel,

A Soldier welds sections of 8-inch pipe that will bring fuel to Allied aircraft, armor, and motor transport in France. September 1944

Photo courtesy U.S. Army Engineer School

Photo courtesy U.S. Army Engineer School

American engineers work on a stone bridge to add support for sections of a petroleum pipeline. France 1944

both officers and enlisted, it bypassed the pipeline training school. In November 1942, it was already stationed in North Africa. By the end of the war, this company released personnel from its ranks to form the nucleus of three more pipeline companies. The first of these companies was the 697th Petroleum Distribution Company.

The first two detachments finished their training and left the Desert Training Center in January 1943. By March, there was dissatisfaction with the detachment system, which tied pipeline units to regiments. An independent pipeline company could do the same job with 20 percent fewer personnel. It was decided in May 1943 that an independent pipeline company should consist of 7 officers and 221 enlisted Soldiers, with headquarters and operating platoons. The training program was greatly accelerated and, in May 1943, an additional four companies started training, which put a strain on the training facility and staff. The facility was expanded, some parts of the training were cut short, and others were extended. In spite of the training shortcomings, pipeline units in Europe were laying 35 miles of pipeline per week, much faster than the 16 miles in 18 days that was first achieved. No theater had enough pipeline troops for optimum operations, and other engineer units were forced to take on pipeline duties. By the end of the war, there were 59 pipeline companies totaling 12,323 Soldiers.[4]

Some companies were formed in-theater by taking a few experienced officers and noncommissioned officers (NCOs) from other pipeline units and augmenting them with inexperienced enlisted men. One such company was the 2656th Petroleum Distribution Company (later designated the 697th), which was formed in North Africa in 1943.[5]

Around June 1943, one officer and nineteen enlisted Soldiers from the 2602d Engineer Pipeline Company (formerly the 696th), headquartered in Bizerte, Tunisia, formed the nucleus of the 2656th Engineer Pipeline Company. This company was then filled with Soldiers and officers from other units in North Africa. After working on projects in North Africa for two months, the 2656th landed at Palermo, Sicily, in August 1943. It was then renamed the 697th Petroleum Distribution Company. After completing a few simple tasks, the company packed up and relocated to Taranto, Italy, on 13 October 1943. The unit's Soldiers set up their base camp at Foggia, where the unit remained during its stay in Italy. From this base camp, the 697th sent out detachments to construct and operate various pipelines and storage tanks in Italy.

"The pipeline companies were often up front with the invasion landing parties. . . Gasoline and fuel oil accounted for more than half of all the tonnage shipped overseas during World War II."

The first assignment for the 697th was to construct a ship-unloading facility at Manfredonia and lay a 24-mile pipeline from there to Foggia. After just 28 days, the first fuel arrived at Foggia. Three 10,000-barrel tanks, one 5,000-barrel tank, the unloading facility, and 24 miles of pipeline had been completed. On 13 November, the first fuel was discharged from the gasoline tanker *Aroostock* and by 25 November, 160,000 gallons of 100-octane aviation fuel a week was flowing into Foggia, which was destined to be the hub of southern Italian fuel distribution. The 701st and the 696th Petroleum Distribution Companies (which were destined to work side by side with the 697th throughout the war) had now joined in the pipeline construction in southern Italy. In nine months, the 697th alone would construct a very large and elaborate network of pipelines and storage facilities. Besides the several airfields around Foggia, the 697th also supplied fuel to 14 other airfields. In addition, the company constructed 43 10,000-barrel tanks and 31 smaller tanks during this time. The 697th, 696th, 701st, 702d, and 704th Petroleum Distribution Companies together constructed 651 miles of pipeline to the airfields and storage facilities in that area of Italy.

On 15 July, the 697th moved out of Foggia to a staging area in preparation for Operation Dragoon, the invasion of France by Allied forces from Italy. D-Day was 15 August and by 16 August the 697th was established at Saint-Raphael, France, receiving materials to begin construction of the unloading facilities on 19 August. The project, which was completed by 30 August, included—

- Tanker discharge lines.
- Three 10,000-barrel storage tanks.
- A 1,000-barrel storage tank.
- Three miles of pipeline to the terminal.
- Three separate racks to fill tanker cars, drums, and cans.

Also, tanker-truck and drum-filling racks were constructed at the airport at Fejus, France, and connected to the port by six miles of pipeline.[6]

Photo courtesy U.S. Army Engineer School

A Soldier closes a valve near the start of the Rhône River pipeline near Marseilles, France. September 1945

It was decided before the invasion that the three refineries and the excellent port at Martigues would be the starting point for a pipeline up the Rhône Valley. On 25 August, an advanced element of two officers and 89 enlisted Soldiers from the 697th went to Martigues, bypassing Marseille and Toulon, which were still under German control. The French had just liberated the town and the Soldiers of the 697th were the first Americans the townspeople had seen. Flares and artillery fire lit the sky the first night since the Germans were still to the west, north, and east. Small units of German soldiers were reported in the area, so the detachment posted extra security on all sides. At this time, the United States Seventh Army engineers established a pipeline operations office at the La Mede refinery, which served as the main office for operations for the next eleven months.

Immediately, the 697th started to refurbish and connect all the refineries into one large storage facility. Difficulties were encountered in the harbor because the Germans had blown bridges and collapsed them into the harbor, which was mined extensively. The first Allied tanker to arrive, on 9 September, was saved from a mine only because the tugboat that was guiding it hit the mine first. The 697th would have lost a detachment of men, and the Lavera refinery could have been seriously damaged, if the mine had blown up the larger ship. While all this was being done, the 697th had a survey crew out locating the track for the pipeline to move north, up the Rhône Valley. On the same day the tug blew up, the first sections of pipe were laid.

From Martigues to Avignon, Valence, Lyon, Dijon, then northeast through Epinal to Sarrebourg, the 697th, 696th, 701st, 1385th, 2814th, and 784th leapfrogged along the Rhône Valley. Each company completed a section and connected with the next company's completed section. The companies were responsible for laying the pipeline and constructing the dispensing terminals along their routes. An example of this was the first section laid. In 16 days, the 697th laid 35 miles of pipeline from Martigues north to the Durance River, crossing the river southeast of Avignon. That section joined up with a section already completed by the 696th, just north of that crossing. Meanwhile, the base camp would remain in place until the pipeline bypassed it, making it impractical to communicate with the units. Then the base camp would move up the line another 50 miles and the process would repeat itself. This proved to be a fast, efficient method to get the projects completed.

It wasn't always a cakewalk for the companies. Sudden heavy rains caused flooding and rapid currents on the rivers, which caused loss of life and material. The terrain was not always flat and easy to cross. The fueling points took time to construct, and captured storage areas often were in dire need of major repairs due to neglect and sabotage. For example, how do you convert an old molasses plant into a fuel storage facility? The winter of 1944-45 was extremely cold with heavy snowfalls, which slowed progress. Crossings that would normally have been dug by pick and shovel had to be blasted out of the frozen terrain. Mines and other hazards were always present. When the companies reached Sarrebourg, France, in January 1945, they could take a break. They had caught up to the rapidly advancing Allied lines, and the Germans had not yet been cleared out of the area west of the Rhine River.

The pipeline companies were accomplishing their mission. By the spring of 1945, "The daily gasoline consumption of the (United States) Seventh Army … exceeded 600,000 gallons, and that of the French First Army only slightly less. Nevertheless, shipments of gasoline matched these expenditures and maintained adequate reserves in both armies at all times." [7]

Starting in September 1944, the 696th started laying a 6-inch pipeline from the Mediterranean, parallel to the 4-inch line laid earlier by the 697th. It was March 1945 before it reached Sarrebourg. By the end of January, the 4-inch line was already delivering fuel all the way from the sea to Sarrebourg. After the Allied spring offensive drove the Germans east across the Rhine, the 697th began to run a pipeline from Sarrebourg to Sarreguemines, France, where the pipeline turned east and crossed into Germany. The pipeline went up to the Rhine River just north of Frankenthal, near Mannheim. The 696th had prepared a crossing by putting a Bailey bridge across the river on existing pylons. The first 4-inch pipeline reached the Rhine on 20 April 1945. By the end of April, fuel was being pumped from the Mediterranean to Germany at a rate of 10,000 barrels, or 550,000 gallons, daily. Since the pipeline system up the Rhône Valley in France and across the Rhine River into Germany had become so expansive, the 697th spent the rest of the war maintaining and operating the pipeline.

The statistics compiled in Europe by this company are extraordinary. From 9 September 1944 to 20 April 1945, the 697th alone constructed 347 miles of pipeline, surveyed another 519 miles of pipeline, strung 412 additional miles of pipe, rehabilitated or erected facilities for 419,600 barrels of storage (the equivalent of 42 10,000-barrel storage tanks), rehabilitated or erected 12 dispensing points, and crossed three major rivers.[8] The Soldiers who had served from the beginning were awarded stars for five campaigns:

- Algeria-French Morocco
- Tunisia-Sicily
- Naples-Foggia
- Rhineland
- Southern France Invasion arrowhead

The unit also was commended for its work at Foggia, Italy.

After the end of the war in Europe, the 697th was decommissioned due to lack of manpower. Its last assignment was to back-flush the pipeline with water, then tear down the pipeline from the Rhine River all the way back to the Mediterranean Sea. No records have been found describing

how far the company got on disassembling the pipeline system before being sent home. The 697th received orders on 8 October 1945 to leave the European Theater of Operations for the States. It left Southhampton, England, on 24 November and arrived in New York on 30 November. The unit was deactivated on 1 December 1945.

Endnotes

[1]United States Army in World War II, *The Corps of Engineers: Troops and Equipment*, 1958, Chapter XVIII, p. 417.

[2] Ibid., p. 418.

[3]Colonel James E. McNary and Colonel Edson W. Berlin, *History of the Development of Military Pipelines*, 28 December 1945.

[4]Reorganization for Global War, Table 10, *Number and Strength of Engineer Table of Organization Units*, 30 June 1945.

[5]The 2656th was a typical pipeline company, and its history is used since there is a large amount of information available on it. This is not meant to take away from the contributions of all the other companies. It is easiest to tell the whole story by focusing on one unit that went the distance, from 1943 to 1969.

[6]William D. Trethewey, *A History of the 697th Petroleum Distribution Company*, 1989, p. 18.

[7]Ibid., p 30.

[8]Ibid., p 31.

Mr. Petty, a farm boy from Iowa when he enlisted in the Army in 1966, spent his three-year Army career in pipeline companies. After leaving the Army, he graduated magna cum laude from Iowa Lakes Community College, which offered a farm equipment mechanic's course. He has been a mechanic for 34 years and is still very interested in the pipeline experience.

Acknowledgement

Thanks are extended to William Trethewey for saving this history. It stands as a testament to the hard work done by the engineers in World War II and those of the "Greatest Generation." It is on record at the archives at the United States Army Engineer School at Fort Leonard Wood, Missouri.

This is Part I of a two-part article. Part II will cover the pipeline story from the postwar years in Europe, to Operation Sledgehammer in the United States, to operations in Thailand, Vietnam, and the Persian Gulf.

News and Notes

Korea's Peninsula Engineer Conference 2008

United States Forces Korea (USFK) invites engineers to participate in this year's Peninsula Engineer Conference (PEC) from 29 January through 2 February 2008 at the Yongsan Dragon Hill Lodge in Seoul, Korea. This year's theme is *Engineer Solutions Through Innovative Technologies*. USFK encourages those with cutting edge ideas, inventions, or techniques to speak to the audience or to sponsor a display. The PEC will feature civil engineering and classified "warfighter" sessions, historical tours, and a 5K fun run. Adjunct to the PEC, the Society of American Military Engineers (SAME) will host a luncheon and a United States – Korea Engineer Ball.

See <*http://posts.same.org/korea/*> for more details. Individuals or organizations interested in attending may contact Mr. Tom Brady at USFK engineers; e-mail <*thomas.m.brady@korea.army.mil*> or call DSN 315-723-3260.

Annual Unit Histories

Each year, engineer units—as well as other Army units—complete annual histories. In the past, these have been submitted to higher headquarters and eventually lost. A recent revision of AR 870-5, *Military History: Responsibilities, Policies, and Procedures*, dated 21 September 2007, instructs units to send a copy of their annual history to their branch history office. This not only allows those offices to maintain a collective branch history but also assists them in their efforts to maintain unit histories, lineages, and honors. If you have any questions concerning annual or unit histories, contact Dr. Larry Roberts, Historian, United States Army Engineer School, at (573) 563-6109 or <*larry.roberts1@us.army.mil*>.

Mine Detection Moves Into the Future:

AN/PSS-14 Mine Detector Requires a License

By Mr. David Holbrook

The AN/PSS-14 Mine Detecting Set is more advanced than any metal detector used for mine detection. The AN/PSS-14 mine detector is only one part of this remarkable mine detection system. The other, and more essential, part of this system is the operator. The complexity of the system requires operators to be licensed to ensure safe and effective operation. For that reason, and for the safety of all personnel involved in route and area clearance operations, commanders must ensure that each operator is properly licensed before using the system in a real-world situation. Licensing operators of the AN/PSS-14 is essential to ensure that both the operator and the mine detector are adequately sustained so they will perform as intended.

Basic Operational Theory

The AN/PSS-14 mine detector applies two technologies—metal detection (MD) and ground-penetrating radar (GPR). The AN/PSS-14 employs aided target recognition algorithms that alert the operator of the presence of a target of interest. A trained and licensed operator learns to mute the MD or the GPR to identify objects buried in the ground, pinpoint their location, and determine if they are potential mines. A trained and licensed operator can detect metal objects in the ground and investigate them using the GPR. The GPR can be used to distinguish potential mines from battlefield clutter and other metal debris.

AN/PSS-14 Fielding

The first step in the fielding process is to educate units on the system's requirements. The Product Manager (PM) for Countermine and Explosive Ordnance Disposal sends a team to the unit's location to conduct a new material introductory briefing. During this briefing, the PM's representative explains the system's capabilities, sustainment requirements, licensing requirements, and available training devices. The primary goal of the briefing is to ensure that commanders lock in time on their training calendar for both the new equipment training (NET) and the unit master training (UMT). The PM has provided the means for every unit that is authorized the AN/PSS-14 to receive the proper training. Before a unit is issued its mine detectors, it must have an appropriate number of "qualified operators."

Training

Both the NET and the UMT are 40-hour courses and are conducted either at the unit's home station or at Fort Leonard Wood, Missouri, whichever is more convenient for the unit. Once the unit locks in the training dates, the NET team arrives at the unit's location, sets up the training site, and begins training. After successful completion of the 40-hour course, the NET team issues the equipment, and the Soldiers who attended the training are considered qualified to operate the system.

Soldiers are being graded on their sweeping techniques at a UMT course.

The requirement is to send one Soldier to NET for each AN/PSS-14 being issued. However, units are encouraged to take advantage of on-site NET by sending as many Soldiers in grade E5 or above as possible, so that those who qualify as operators can take the additional training to become unit master trainers. Otherwise, the Soldiers will have to attend a separate 40-hour operator course before attending UMT.

The UMT course, which is taught by United States Army Engineer School-trained master trainers, is conducted to provide a sustainment capability to each unit issued the AN/PSS-14. Units are encouraged to send as many qualified sergeants to this training as possible. These individuals will develop unit standing operating procedures (SOPs) and conduct new operator and refresher training after the fielding process is complete. It is because of the licensing requirement for this system that UMT course attendees must be E5s or above.

The Sweep Monitoring System (SMS) is a training aide that provides Soldiers with immediate feedback on their sweep techniques.

Licensing

Officials at the Engineer School believe that any equipment designed to detect explosives, mines, or other hazards must have a licensing requirement associated with it. Since the proper use of this equipment will prevent the death or injury of Soldiers, the licensing requirement ensures that personnel are proficient in using it. The current Army Regulation 600-55, *The Army Driver and Operator Standardization Program*, requires military personnel and Department of the Army civilians to have an Optional Form (OF) 346, *United States Government Motor Vehicle Operator's Identification Card*, and demonstrate their proficiency to operate mechanical or ground support equipment, including "mine-detecting equipment, truck mounted—all makes

and models," and "miscellaneous equipment, any equipment determined by the local commander or higher authority to warrant licensing, such as . . . detecting sets, mine portable, AN/PRS-7 and AN/PSS-11."

The Engineer School has recommended changes to the regulation to clarify the licensing requirement for the AN/PSS-14. The first draft of these changes was sent out for review and the final version is scheduled for publication in early 2008. Recommendations include that "all military personnel must have a certified OF 346 or DA Form 5984-E and demonstrate their proficiency to operate mine-detecting or other explosive-detecting equipment, to include all portable, hand held, and truck-mounted models (including, but not limited to, AN/PSS-12 and AN/PSS-14)."

Training Target Sets (TTS) are used to simulate live mines for AN/PSS-14 training.

Summary

It is imperative that commanders become familiar with the capabilities of the AN/PSS-14. This system is essential in safe route clearance operations in the current theater of operations and in future conflicts. The Engineer School has provided all the tools required to establish a successful training and licensing program, to include providing units with a draft SOP for adoption and immediate implementation. The product manager has an aggressive fielding schedule for the AN/PSS-14 for the next few years. Units that do not already have NET and UMT on their schedules should contact Mr. Rob Sellmer, AN/PSS-14 Fielding Manager, at 703-704-3397, DSN 654-3397, <*robert.sellmer@us.army.mil*> for NET and Mr. John Sullivan at 573-563-7646 or cell 573-528-9081 for UMT immediately to ensure that they are ready to deploy with the best route clearance capabilities possible.

Mr. Holbrook is a retired engineer lieutenant colonel and former battalion commander. He currently works as a senior analyst for BRTRC Research Corporation at the Fort Leonard Wood, Missouri, office.

Dedication

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

Chitjian, Private First Class Adam J.	3d Battalion, 8th Cavalry Regiment, 1st Cavalry Division	Fort Hood, Texas
Lambert, Specialist David E.	237th Engineer Company, 276th Engineer Battalion, 91st Troop Command	West Point, Virginia
McGovern, Captain Timothy I.	2d Battalion, 7th Cavalry Regiment, 1st Cavalry Division	Fort Bliss, Texas
Mele, Sergeant John W. II	1st Battalion, 30th Infantry Regiment, 3d Infantry Division	Fort Stewart, Georgia
Smitherman, Specialist Brandon W.	2d Battalion, 7th Cavalry Regiment, 1st Cavalry Division	Fort Bliss, Texas

Sapper Pac – The Tool Kit for Engineers

By Mr. Alan P. Schlie

Engineers are almost universal in their agreement to carry some tool on their belt or in their pocket. The most popular tool seems to be multi-pliers, with hundreds of types available from numerous manufacturers. The second most popular would probably be a tie between a pocketknife and a flashlight. Tool points and nut drivers would come in handy and can be attached to one of the multi-pliers' stems. Other tools are more specialized and might include a mine probe or a trip wire grapnel with throwing cord or a compass.

Considering the variety of situations a Soldier encounters in which a tool is needed, these are all good choices. But until now, each was carried individually or tossed into a pouch, presenting its own hazards. This is no longer the case; the United States Army Engineer School and the Program Manager for Sets, Kits, Outfits, and Tools (PM-SKOT) teamed to create the Sapper Pac as a Soldier Enhancement Program (SEP) initiative and placed the tools into a zippered pouch that allows easy access and prevents the items from inadvertently falling out while digging around for something else. The bags are modular lightweight load-carrying equipment (MOLLE) compatible and available in black or Army combat uniform (ACU) camouflage pattern.

There are three versions of the Sapper Pac—one for sappers, another for squad leaders and platoon sergeants, and a third for platoon leaders. The Sapper Pac contains Gerber demolition explosive technician (DET) multi-pliers with numerous tool points and nut drivers, an Inova X1MT flashlight designed with a wand attachment for signaling and a stake attachment for planting in the ground, a sectionalized mine probe with shaft extensions and multiple metal and plastic tips, a credit card-size bendable trip wire grapnel with 15 meters of 550 cord, an inspection mirror, and a thumb saw that cuts through wood and metal. In addition to that, there is still room in the Pac for a memorandum book, a pen, a small tape measure, and a carabiner.

The Sapper Leader Pacs contain the same multi-pliers, flashlight, and tape measure. In addition, there is a folding saw with a full-length serrated blade for cutting wood and metal and a pencil-style knife sharpener. The difference between the two Pacs is that the squad leader version includes a Leica Laser Range Finder (LRF) that is accurate to 1,200 yards, and

Sapper Pac

Sapper Pac for Squad Leaders (with a Laser Range Finder)

Sapper Pac for Platoon Leaders (With a Thermal Imaging Camera)

the platoon leader version includes an Insight® Technology Thermal Imaging Camera (TIC) with software to download the video captured to any laptop.

Sapper Pacs will become components of Squad Pioneer Tool Sets and be available in clothing sales stores in the near future, but units can obtain them now by using the following National Serial Numbers:

Sapper Pac	5180-01-538-4213
Sapper Leader Pac (Squad)	5180-01-542-1075
Sapper Leader Pac (Platoon)	5180-01-539-5597

For more information, contact the Item Manager at (309) 783-0131, or e-mail <*dan.stark@conus.army.mil*>.

Mr. Schlie recently retired as a force documentation analyst with the Capabilities Development & Integration Directorate (CDID), United States Army Maneuver Support Center, Fort Leonard Wood, Missouri. A retired command sergeant major, he served in various capacities in Europe, Korea, and the continental United States throughout his career.

Organizational Leadership at the Battalion Level

By Lieutenant Colonel Laurence M. Farrell

"Get your communications up or you're fired," said the brigade commander. The words stung. As the battalion commander stood in front of the brigade commander, he was deeply disillusioned. The brigade's communications structure had failed during the exercise, and the brigade commander wanted to know why. The battalion commander could not provide an answer. Even worse, he had no suggestions on how to improve the communications structure. He wondered how this had happened. Ninety days ago, he was an engineer battalion commander with technical knowledge in bridging, construction, and demolitions. Since that time, his battalion had converted to a brigade special troops battalion (BSTB) structure, and his technical knowledge of his subordinate commands was nonexistent. As the higher command headquarters of the brigade's signal company, he was responsible for the communications posture of the brigade. He felt mixed emotions. He regretted that he had not created a formal plan to learn more about the communications structures and the capabilities of the signal company. And he was angry that he was being chastised for the exacting details of signal requirements when, as an engineer officer, his knowledge of this area was minimal. Finally, he resolved to fix the structural issues in his battalion that had allowed the situation to happen.

This scenario actually occurred to a commander of a BSTB immediately after it converted from an engineer battalion. As part of the modular force structure, the Army has created the BSTB and the divisional special troops battalion (STB). The BSTBs and STBs usually contain, at a minimum, four disparate units at the company and platoon levels. The following are examples of how they may be configured in the current force structure at the divisional level and below (see Figure 1).[1]

- BSTB (military intelligence, signal, chemical, military police)
- STB (signal, security, adjutant general replacement, a tactical operations center (TOC)/tactical communications ??? (TAC) support, and the band)

These units require a different leadership style than a combined arms battalion that contains combined arms companies and a similar combat engineer company. For leaders to be more successful at commanding a BSTB or an STB, current leadership doctrine should be fully understood and specific procedures should be followed.

According to Field Manual 6-22, "Leadership is the process of influencing people by providing purpose, direction, and motivation, while operating to accomplish the mission and improving the organization."[2] The Army officially classifies leadership into three levels: strategic, organizational, and direct (see Figure 2, which is Figure 3-3 in FM 6-22).[3] Each leadership level requires a different leadership focus while upholding the Army's eight core leader competencies and supporting behaviors described in FM 22-6.[4] At the battalion level, in most cases, direct-level leadership is still the preferred method. Most field grade leaders at the battalion level (commander, command sergeant major, executive officer, and S3) have always led at the direct level (platoon and company). That direct-level leadership lends itself to "like" units, and a battalion—even in today's modular environment—still has a moderate footprint. It is when the battalion command team

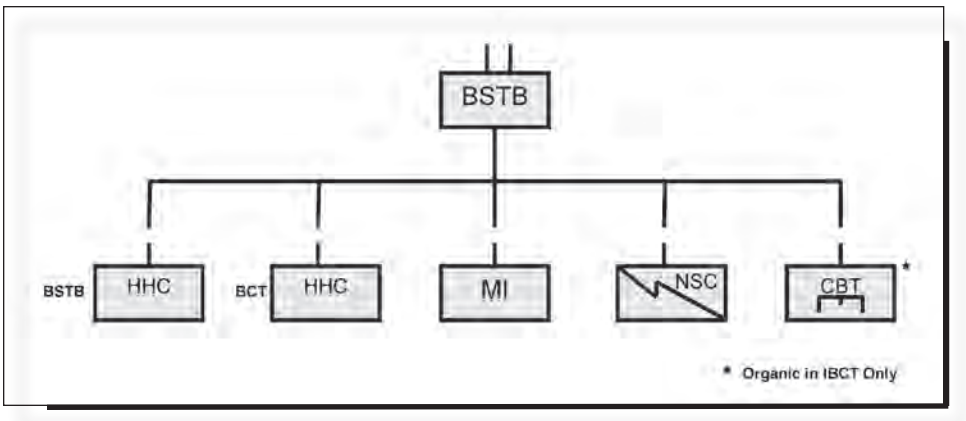


Figure 1. The Brigade Special Troops Batalion (Figure 2-1 from FM 3-90.61)

leads a unit at the direct level that should be led at the organizational level that structural deficiencies become possible.

Leading at the organization level is a new and challenging experience for most field grade officers and noncommissioned officers. The Army's leadership manual reflects this dynamic (challenge ???) by stating that "organizational leaders generally include military leaders at the **brigade through corps levels"** [emphasis added].[5] The manual also states that "organizational leaders usually deal with more complexity, more people, greater uncertainty, and a greater number of unintended consequences."[6] This article provides a short, comprehensive list of techniques and focus areas that are effective at the organizational level of leadership and are directly applicable to divisional BSTB and STB commanders, command sergeants major, executive officers, and S3s. This article also recommends potential solutions the Army can implement on a long-term basis to improve the performance of the BSTBs and STBs.

Figure 2. Army Leadership Levels (Figure 3-3 from FM 6-22)

Organizational Level Techniques

The following techniques are effective at the organizational level of leadership:

- Understand the technical requirements
- Know the core competences
- Conduct routine counseling
- Provide a vision

Understand the Technical Requirements

Leaders at all levels must have a basic understanding of the technical requirements of their subordinate units. This is one of the greatest challenges of BSTB and STB field grade leaders, and they often neglect or minimize for multiple reasons, to include:

- They may discount their role as technical advisors of a battalion-sized element.
- They may think that they do not have time to learn new technical skills.
- They may decide that fully delegating the technical part of their duty performance is acceptable.

These perspectives, though seemingly reasonable, are not in keeping with current Army doctrine. To put it bluntly, leadership requires a technical component. This is clearly stated in FM 6-22: "Direct, organizational, and strategic level leaders need to know what functional value the equipment has for their operations and how to employ the equipment in their units and organizations. At higher levels, the requirement for technical knowledge shifts from understanding how to operate single items of equipment to how to employ entire systems."[7]

This paradigm is also reinforced by the guidance given during a recent lieutenant colonel command board. Military Personnel (MILPER) message 06-210 states that "officers will be slated per the Army command/key billet guidance prioritizing skills and experience… officers should consider how their skills and experiences best match those commands or key billets available and make preferences that best match their personal desires to where their skills and experiences exist. Officers should focus on specific or like-type units where they have previously served and not necessarily the location."[8]

The guidance and doctrine are clear. Leadership has a technical component, and it is relevant at the higher command levels. The challenge is to implement a program that trains field grade leaders. At the organizational level, a simple solution is a comprehensive leader development program. The value of a long-term leader development program should not be discounted. A focused program of instruction, with hands-on training with proper training aids, can result in a high degree of technical competency in a relatively short amount of time. The United States Army Engineer School uses this method to teach complex engineering subjects—such as the analytical bridge classification method in the Captains Career Course—to many officers with no engineering experience. This process can be replicated at the battalion level for a variety of topics. Finally, most divisional life cycle units experience their turnover immediately after a deployment and then are refilled and held steady for about three years. This situation further allows the "in-house" training program to be spread out over a longer time period.

Know the Core Competences

Leaders at the organizational level must focus on the unit's core competencies to have the greatest effect. This dictum

"Leaders at the organizational level must craft a vision and consistently reinforce it throughout the command."

has even more relevance if the unit is composed of disparate subunits such as in the BSTB and STB. In a maneuver battalion, with four like subunits, the battalion leadership can choose a variety of military occupational specialty (MOS)-specific tasks to devote training time, energy, and resources. Here, the commitment of resources has an economy of scale and an immediate effect across the battalion. This is not the case in a BSTB or an STB. In them, the battalion leadership usually does not have time to generate multiple distinctive training programs for each company. The essential question is, Where can the battalion leadership leverage their experience to maximize the training? Fortunately, the Army provides the answer— the 40 Warrior Tasks and 11 Battle Drills. According to the Chief of Staff of the Army, these Warrior Tasks and Battle Drills "illustrate warrior-focused training" in support of the "long war."[9]

In units such as the BSTB or STB, where there are always competing demands for specific MOS training and combat training, the battalion leadership is critical in providing a balance between these two competing demands. Finally, in focusing on the Warrior Tasks and Battle Drills the battalion leadership can conduct battalion ranges and minimize risk. The value of this effect cannot be overestimated. Many subunits in a BSTB or an STB have limited exposure to the requirements of live fire ranges and require battalion-level support to execute the range properly and safely.

Conduct Routine Counseling

In BSTBs and STBs, the battalion leadership must conduct written, deliberate performance counseling "routinely." This counseling requirement has added importance if the units are geographically dispersed—as most BSTBs and STBs are. Though FM 6-22[10] and DA PAM 623-3[11] clearly state the Army counseling requirements, many battalion-level leaders and above do not fulfill the requirements according to the regulation. Written counseling is often replaced with verbal counseling that is conducted *ad hoc*. Though verbal counseling can be effective, its application is usually limited to direct-level leadership of like units. For example, it is easier for a maneuver commander to give guidance to a subordinate maneuver unit that needs to improve the company's score on "Table 8 Gunnery" than it is for a BSTB commander to give guidance on a communication problem. Though this might not be "fair," it is the reality.

In units such as BSTBs and STBs, written counseling serves as the intent paragraph similar to the operations order. According to FM 6-22, counseling "communicates standards and is an opportunity for leaders to establish and clarify the expected values, attributes and competencies."[12] Since the battalion commander and command sergeant major have limited time, exposure, and probably technical expertise, the counseling provides a "compass" for priorities for the long term. This is key for an organizational leader to be effective.

Provide a Vision

Leaders at the organizational level must craft a vision and consistently reinforce it throughout the command. Often a vision is the "shortest leg" and most neglected of the "command triad" (command philosophy, training guidance, and command vision). Unlike training guidance—which must be issued quarterly and validated at the quarterly training brief—there is no defined metric that measures if a unit is making progress toward the vision. Unlike a command philosophy, which tends to be more specific in nature, command vision statements tend to be "nebulous." The result is often a PowerPoint® slide put up in the battalion headquarters and then ignored. The vision, when properly utilized, provides clarity to the command's purposes. It shows junior-level leaders what the organizational long-term goals are in the unit. The vision has added importance in BSTBs and STBs. Unlike a maneuver unit, where Soldiers clearly see that they are part of a larger team working toward common goals, Soldiers in a BSTB or STB may feel that they are operating independently from the other companies in the battalion. An organizational vision serves as a unifying tool that allows Soldiers to see that they have common goals regardless of their MOS.

Army Level Solutions

Potential solutions at the Army level, such as the following, can improve the performance of BSTBs and STBs:

- Create a DA-certified BSTB/STB field grade leaders course
- Create a BSTB/STB identifier

Create a DA-Certified BSTB/STB Field Grade Leaders Course

The Army should create a field grade leaders course for both officers and field grade senior noncommissioned officers assigned to BSTBs and STBs. Although there is tremendous value in having a functional, enforced officer professional development (OPD) program at the organizational level, there are limitations to this approach. Similar to most units, personnel will have competing demands on their time, all units are susceptible to last minute requirements and, most importantly, a DA-centralized course creates a common skill set across the Army and standardizes the basic requirements of field grade leaders in BSTBs or STBs.

Prior to modularity, the divisional "slice" battalions trained and maintained their respective units and then attached these units to the maneuver commander for employment. The senior leaders of these battalions were experts in their respective fields and honed their skills to better train and mentor their subordinates. That specific function of mentoring subordinates on technical and maintenance requirements is extremely difficult without a formal training program provided by the Army. It is impossible to mentor someone on something that you are not familiar with.

The field grade leader training course would be approximately three to four weeks long with each branch or "module" having one week of dedicated training time. (The Army already embraces the concept of specific training courses for commanders and command sergeants major in courses such as the Garrison Precommand Course at Fort Belvoir, Virginia, and the Recruiting Precommand Course at Fort Jackson, South Carolina). Although three to four weeks might seem excessive, the Reserve Component Captains Career Course is seventeen days long and covers one branch with a tactical focus. The BSTB course would cover tactics as well as maintenance issues. That the Army has multiple preestablished ongoing training courses for stateside garrison commands, but not for complex units going into combat, is an "oddity" that should be corrected.

Create a BSTB/STB Identifier

The Army should create a BSTB/STB identifier and use the identifier in placing officers and noncommissioned officers that have been selected to command at the battalion level. According to MILPER message 06-210, the Army is placing priority on assigning officers and noncommissioned officers in units where they have previously served.[13] This criterion should formally extend to the BSTBs and STBs. Having commanders that have served previously in a BSTB or an STB, and that have completed the BSTB/STB certification course, would solve the problems described above in mentoring junior leaders concerning training and maintaining equipment. This has great value both up and down the chain of command. Not only does it bond the junior leader with the senior officer and noncommissioned officer, but it also prevents situations such as the one described in the scenario at the beginning of this article.

Summary

Commanding a BSTB or an STB is a challenging experience. For many battalion-level leaders, it is the first time in their Army career that they are leading Soldiers with different skill sets from their own, are geographically dispersed, and belong to distinctive subunit companies. In this type of unit, the battalion leadership is leading at the organizational level. At this level of leadership, the leader must follow doctrine as the foundation for his/her actions. Though there are actions that the battalion leadership can implement to address the complexity of this organization, such as a focused OPD program, I believe that ultimately the Army should create a BSTB/STB certification course. This course would quickly and significantly enhance the technical and tactical knowledge of the field grade leaders in these units, enhance the mentoring process and leader development that occurs for the battalion command team and, most importantly, increase the combat capacity of these units.

Lieutenant Colonel Farrell, who served as the Outreach Operations Officer for the Director of the Army Staff at the time this article was written, is the Deputy Brigade Commander of the Gulf Region North District – Tikrit, Iraq. He has held a variety of engineering assignments, to include commanding a One-Station Unit Training (OSUT) Company, serving as the Executive Officer for the Department of Civil and Mechanical Engineering at the United States Military Academy, and as the S3 of the 2d Infantry Division Engineer Brigade. He holds a civil engineering degree from the Virginia Military Institute and is a Registered Professional Engineer in Missouri. Lieutenant Colonel Farrell has been selected to command an Engineer District.

Endnotes

[1] FM 3-90.61, Brigade Special Troops Battalion, 22 December 2006, Figure 2-1, p. 2-1.

[2] FM 6-22, *Army Leadership*, 12 October 2006, p. 1-2.

[3] Ibid., pp. 3-6 and 3-7 and Figure 3-3.

[4] Ibid., p. 2-7.

[5] Ibid., paragraph 3-39, p. 3-7.

[6] Ibid., paragraph 3-40, p. 3-7..

[7] Ibid., paragraph 6-36, p. 6-7.

[8] MILPER Message Number 06-210, *FY08 Lieutenant Colonel Army Competitive Category Centralized Selection List*, issued 28 July 2006, page 7.

[9] Chief of Staff of the Army speech at the Association of the United States Army (AUSA) Convention, 10 October 2006.

[10] FM 6-22, Appendix B.

[11] Department of the Army Pamphlet 623-3, *Evaluation Reporting System,* 10 August 2007.

[12] FM 6-22, paragraph B-17, page B-3.

[13] MILPER Message Number 06-210, page 7.

Note: The opinions expressed in this article are those of the author and do not necessarily reflect the official policy or the positions of the United States Army Engineer School, the Maneuver Support Center, the United States Army, or the Department of Defense. The author invites your feedback concerning current BSTB and STB employment and past experiences for a follow-on article. His e-mail address is *<laurence.farrell @us.army.mil>*.

A Private's Life

My Journey Through the Second World War

By Mr. Murray Mendelsohn as told to Dr. Christopher Hennen

June 6, 1944, began just like many other days at Camp Rucker, Alabama. It was sunny and hot—normal for Alabama—and after the usual morning chores, word came that there was to be a battalion meeting at the post movie theater—another normal occurrence. But there was one thing that set that morning apart—rumors were rampant that the long-awaited Allied invasion of France had begun to liberate Europe from Nazi occupation. We were an anxious group of Soldiers; we had finished our training and were anticipating orders for a trip overseas. The only question seemed to be which theater—European or Pacific?

Our 159th Engineer Combat Battalion commander, Major Michael F. McNamara, strode in and took center stage, his normal position. The major came right to the point: The invasion had started in Normandy earlier that morning, and he was only sorry that the 159th had missed out on the glorious event. But he assured us that there was a second wave coming, and we would be part of it.

After leaving the theater, we tried to go back to our daily routine. Now we knew our days at Camp Rucker were numbered. There was still talk about the direction in which the battalion would go, but the betting seemed to be on Europe because of the invasion. All furloughs were cancelled, meaning I would not get the one that had been promised me after completing my training at the Fort Belvoir, Virginia, Engineer Replacement Training Center in April. After that training, many of us had been sent to the 159th, knowing that the outfit was preparing to go overseas and had to be numerically strengthened. At Camp Rucker, we were blended into the unit, a group that had been together for more than a year and seemed to be ready for its ultimate mission of being combat engineers.

Major McNamara was right—we were going to be part of the second wave in Normandy. In a matter of a few days, we were restricted to the base, and the packing process was well underway. Then the order came to move out. We were taken to the railroad and boarded a train for the ride to the port of embarkation. We had Pullman cars, so we knew it was going to be a long ride.

The train finally reached its destination at Camp Myles Standish, near Taunton, Massachusetts. We were taken to our last U.S. posting, assigned our slots in the barracks, and given passes to go into either the neighboring towns or to Boston. We decided to take advantage of our borrowed time while we could. Who knew when—or if—we'd have a chance to enjoy ourselves like that again.

Then came the announcement we had both expected and dreaded: We were restricted to the base, which could mean only one thing. On the night of June 26, we boarded our train, which left us alongside a hulking, darkened ship that was moored to a South Boston pier. We picked up our duffel bags and boarded the ship—the *USS West Point.* It was a luxury liner that had been converted in 1940 as the flagship SS America of the United States Line fleet, sailing between New York and England and France. Now it was a U.S. Navy troop transport, painted battleship gray and with U.S. Sailors manning guns posted around the ship.

United States Navy photo

The *USS West Point*, a converted luxury liner that was completed in 1940 as the flagship *SS America* of the United States Line fleet, sailed between New York and England and France. Now it was a United States Navy troop transport, painted battleship gray and with U.S. Sailors manning guns posted around the ship. 1943

Once aboard, we kept trudging downward, finally reaching our bunks. We had some 10,000 Soldiers on board, mainly engineers and Medical Corps people, we were told. We were stacked three and four high but, as we had long-since learned, when it was time to call it a day, we went to sleep. When we awoke and finally got up on deck, we were already far out to sea. Standing near the stern, we could see that the ship was pursuing a zigzag course, and we were all alone on the Atlantic.

Finally, on the morning of July 4, 1944, after sailing for seven days, we could see seagulls and then land, which we were told was Scotland. Many of us had thought we would undergo further training, but that was not to be. Instead, every few days we packed up and headed farther south. By July 15, we had reached Falmouth, an old fishing port on the English Channel. We had large squad tents right near the water, where we could see many ships waiting to load up. It was only a matter of time before we would be heading to Normandy.

Our waiting came to an end on July 18, when the battalion boarded two waiting Liberty ships, the *Louis Kossuth* and the *Lou Gehrig*. While I felt more akin to the *Gehrig*, since the Yankee ballplayer had been a resident of my hometown—New Rochelle, New York—I was put on the *Kossuth*. When all the troops were on board, the ships left the harbor and lined up in a large convoy, escorted by naval warships. We had a Navy gun crew fore and aft, but otherwise the ship was manned by a Merchant Marine crew.

It was a slow ride across the channel, and largely uneventful. We slept in two shifts, switching from bunks to deck. The only food was either C or K rations. There was a large kettle at the back of the ship where we could heat the cans and get water for Nescafe®.

We just sat there, passing the time of day and watching what was going on at Utah Beach. Finally, on the morning of July 22, a launch pulled up alongside, and Major McNamara climbed up the rope that was hanging down the side of the *Kossuth*. He called us all together at the ship's stern and told us we were about ready to get off the ship and start on our new adventure in Normandy. We were indeed the second wave, and he knew we would prove ourselves to be true members of the 159th. He knew there would be casualties, but he also knew we would earn commendations for what we were about to do. He continued in that vein, then he said he would see us onshore. He went over the side of the ship again and proceeded on to the *Gehrig*, undoubtedly to make the same speech.

It was a cloudy afternoon as we were told to get ready to go over the side to a waiting "rhino," a large flat barge. We had all our belongings and weapons on our backs. Finally, my turn came to clamber onto the rope netting and start my descent. I had visions of losing my grip and going for a swim in the English Channel, but I managed to get down and finally touch the deck of the rhino. Our trucks and other equipment also came over the side, and when we were loaded, the Sailors took off for the beach. The rhino went right up to the shore, and we jumped off onto our destination—Utah Beach, Normandy. We were taken to our section of the beach and waited for the battalion to assemble. We would have to spend the night on the beach, but the weather was decent, so that would not present a problem.

Night fell and, of course, there was a complete blackout on the beach. We were told to expect some German reconnaissance planes and, as predicted, our intelligence was correct. They were greeted by our antiaircraft guns, and soon "Bedcheck Charlie" left the area to make his next nightly visit. In the morning, we got on our trucks and moved off the beach, which was full of other troops and supplies, all waiting to go inland. It was a massive job to have assembled everything, and now we were going off on our own for our first mission.

As the 159th rolled away from the beach, we had our first views of Normandy. Our first stop was St. Mere Eglise, a town at the heart of the American airborne operations on D-Day, and it looked largely destroyed. We were on narrow country roads, passing many farms behind the massive hedgerows on both sides of the road that marked the boundaries between the various farms. Finally, our group pulled into a farm area surrounded by the hedgerows. We unloaded and set up our camouflage netting to conceal our location. We were well used to our routine of loading and unloading our equipment on the back of our 2 1/2-ton truck. We were to get lots more practice.

We set up our tactical operations center under some trees alongside the hedgerow. As part of the Headquarters and Service Company of the 159th, we had plenty of work to catch up on. So we spent a busy afternoon sorting all our material and finding a place where we would spend the night. We had to be careful about exposing our location, because the Germans were not too far from our site in Barneville. At that time, the American position in Normandy, while secure, was not too deep. The 159th was given the mission of clearing mines and maintaining the roads. We were now part of XV Corps and 3d Army.

News soon reached us of the battalion's first casualties; two privates in Company B had been killed while clearing mines. Their first day of work marked their deaths. Such are the perils and uncertainties of war.

We were on the road, moving toward St. Lo, when an attack was launched to take the town, which marked the breakout from Normandy and the steady advance toward Paris and, in our case, toward Brest, the seaport at the western tip, right on the Atlantic Ocean. I can still see and hear the planes flying overhead, on their way to bomb the Germans. I had never seen so many planes before, and the noise was deafening when they loosed their bombs on the targets. Within a few days, we were in the vicinity of Avranches, which marked the spot where the 159th turned toward Brittany and the eventual target of Brest. It had been an important port for the American Army in World War I, and now it was decided we should take it again to relieve the pressure on the Normandy ports.

Bulldozers level ballast on an abandoned railway roadbed as Soldiers from the 159th Engineer Combat Battalion construct a highway to move supplies to the front across the Our River in the 3d Army sector. February 13, 1945

The battalion was placed into Task Force A, and it was to be deployed primarily as infantry in the big push through Brittany. It was decided to leave the Personnel Section (which included me) behind for the time being in the big field we occupied. There were ten of us, including our commanding warrant officer. We were given plenty of C and K rations and little else, besides all our records. We said our farewells to our friends as they left, and we set to work organizing our own area. We were on the main highway leading from the beaches, and it had been designated a "Red Ball Express" highway. Only priority units could use the road, because getting supplies to the front was considered paramount. This gave us an observation point from which to see everything passing our front door, 24 hours a day. We had to establish our own security, and then we set out to keep up with our daily routine.

There were no other outfits located in our immediate vicinity; we were our own outpost. We were really on detached service, for want of a better term. One afternoon, rifle fire jolted us out of our routine. No one was hit, but we went on alert and checked out the few houses at the far side of our field. We never found the shooter, but it didn't happen again. We knew Brittany was completely occupied by the Germans, and that meant plenty of combat for the 159th. My Personnel Section was itching to rejoin the rest of the battalion, but we had no communication with the outfit. Finally, after more than a week of waiting, a truck came to pick us up. That afternoon we arrived at headquarters, west of Morlaix.

The battalion was constantly on the move, as the American forces kept forcing the Germans back to their last line of defense, the city of Brest, which finally fell in late September. Within a few days, orders came through for VIII Corps, of which we were a part, to move northeast to Belgium. VIII Corps had been expanded greatly during the Brest campaign and, during its course, it became the sole corps in the newly formed 9th Army. The 159th packed up and headed off on a long overland movement. We drove back through Brittany, where we were greeted with enthusiasm in each town. On the second afternoon of our trip, we passed to the west of Paris, and we could see the Eiffel Tower in the distance. That night we camped in a field in St. Quentin, and the next day we finally reached our destination—Bastogne, Belgium. We found our bivouac area and spent the next few days there, waiting for a permanent location to be selected. Bastogne was the headquarters of VIII Corps until the Battle of the Bulge occurred and German pressure around the city—coupled with successive U.S. withdrawals in the area—forced the Corps headquarters to relocate to the vicinity of Neufchateau, about 20 miles southwest of Bastogne. After a few days, we headed off to nearby Luxembourg. My company wound up in the small farming community of Useldange.

We were quartered in the local school, our first indoor location since our arrival on the continent and a big improvement over all those fields we had slept in. It looked as if we were going to stay put for a while at least. The battalion was assigned to do road and bridge repairs, for the most part—basic engineering work. The whole of Luxembourg had been secured, and there were several infantry divisions nearby that had come from Brittany. Battalion headquarters had been placed in a fine stone house next to the remains of an 11th century tower and wall. In a few days, my section moved into the chateau too.

The people in Luxembourg were very friendly and really felt indebted to the Americans for freeing them from the Nazis. This 2 1/2-month period before the onset of the Battle

of the Bulge proved to be the best duty the battalion had in its stay overseas. Luxembourg had become a quiet area that required normal engineering work and little combat. Gradually, the full-strength infantry divisions that had been in this Ardennes area were being shifted, most of them to the Huertgen Forest on the German-Belgian border. They were engaged in a vicious battle of attrition and suffered many casualties. As the original divisions involved were depleted, the fresh divisions from our area were sent to take their places. Our Personnel Section stayed put and did its usual day-to-day work.

Our area was supposed to be a quiet paradise for war-weary troops. The 9th Armored Division had just come over from the States, and one unit was quartered in Useldange. We heard that the 4th and 28th Infantry Divisions had also come into the area after being mauled in the Huertgen Forest. Without warning, on December 16, 1944, the Battle of the Bulge erupted. Confusion and panic reigned at first; orders came through to our battalion headquarters for the 159th to link up with the 4th Infantry Division in the Consdorf region of Luxembourg. On December 17, all the line companies, plus elements of Headquarters and Service Company, moved out to be deployed as infantry alongside the 4th Division.

Back in Useldange, the remainder of Headquarters and Service Company went on full alert. We had to take up the slack for the part of our unit that had moved up to Consdorf to join the 4th Division. We became responsible for the security of the area, which meant the addition of guard duty and other chores to our day-to-day assignments. The sudden, unexpected attack had really changed our thinking. One moment, we had been looking forward to the holiday season, and the next moment, war consumed our thoughts. The weather had turned nasty, and snow began to fall. That first night, I was assigned to guard a critical pumping station. We drove out to a back-road location nestled in a group of trees. I was told that a Luxembourger who was in charge of the station would come along during the night to do maintenance and see that all was in order. However, my mind imagined other, more frightening scenarios.

It was very cold; snow covered the ground, and the night was very dark. I walked around the area frequently, as much to keep warm as anything else. I heard a motorbike approaching as I was standing near the building. I could make out the silhouette of a tall man, dressed in a full-length leather coat, getting off the motorbike. I hailed him and asked for identification. He spoke some English and told me he was the man in charge of the pumping station. I breathed a sigh of relief, as I really did not want to tangle with a saboteur that night. He opened the station, and we went in. He checked the equipment, and we had a brief conversation in German. I told him I would be back several times during my tour of duty that night. I was happy I had an excuse to get in out of the cold a few times, and the shift passed a little more quickly by adding some conversation to the mix. I was happy when my replacement came along, and I took him in to meet the technician. Then, it was back to Useldange for some much-needed sleep. The weather remained overcast with periods of snow and fog. It was definitely not a time for flying, so we couldn't expect any air support.

We all waited for any news about how our friends were doing up at the front, a short distance away. There was interchange between the different locations, but there was very little specific information. We heard that the German attack had caught us by surprise, and they had achieved some early success. The saying "fog of war" truly applied. We did get delivery of *Stars and Stripes*, a well-written daily GI newspaper, but the action was so intense and changing so rapidly that it was not an up-to-date account of the situation. Basically, we relied on our headquarters in Consdorf for news. As the days passed, we heard that the battalion was seeing quite a bit of action, and there had been many casualties. It was a confusing and frightening time.

One of the problems was the lack of knowledge as to how far the Germans had advanced in our area. Basically, we did not have any patrols out but relied on our drivers who were in the area. We decided to go to the three towns where the line companies were located and retrieve the things they had left behind when they rushed out to the front. The next morning, I was assigned to go to Bettborn, about 5 miles away, to get Company B's belongings. We took a couple of trucks and took off, not knowing who was there. Bettborn proved to be deserted, since the Luxembourgers had also evacuated. We went to the houses that we knew had been used by our colleagues and did a fast job of assembling everything—mainly duffel bags—and throwing them onto the trucks. Then we headed back to Useldange to unload what we had collected. We found out that all our locations were still in our sector, and they stayed that way throughout the battle. This was very fortunate, because other nearby towns, such as Ettelbruck, had been taken and largely destroyed.

The overcast skies finally broke on December 23, and we began to hear the sound of the American planes and see them overhead. This would make a great difference, and we all were encouraged. We were still getting fragmentary reports about the battalion, but nothing definitive. Our part of Headquarters and Service Company was ordered to move to Rollingergrund, a section on the northern edge of Luxembourg City, so we packed everything and prepared to move out. It was a sad occasion for us, as we had been there for two months and had developed many friendships and much mutual admiration between the Luxembourgers and ourselves. This was one of the frequent reminders that you couldn't become too sentimental at times like this, but still there was a lot of emotion when we finally pulled out. It was no longer unusual for us to simply pack up and go at a moment's notice. The Personnel Section was sent to a school, and we set up our operations there. We continued with our extended duties and hoped the rest of the battalion would join us soon. The next day, the 159th arrived, and it was a relief for all of us to be reunited.

We moved into several houses in Trois Vierges, Luxembourg, and went about our work. The Germans had occupied the town, but much of it wasn't as heavily damaged as this. There was quite a bit of water in the streets, but the billets were still dry. Then the Germans opened a dam and flooded the town, forcing us to relocate. February 2, 1945

Our compatriots told us about the heavy fighting they had faced in the Consdorf–Scheidgen area. There, a part of our Company C, collocated with Company B, held off elements of a Volks-Grenadier division on Hill 313, a strategic piece of terrain overlooking a vital road network. Company B caught the full force of the initial assault, supported by intense German artillery fire. Our combat engineers had no working radios and were greatly outnumbered. They had no protection for their flanks and no artillery or air support. Almost out of ammunition, they were forced to fall back to Scheidgen; but to our surprise and relief, the Germans made no move to pursue them. As we questioned our buddies, we learned that there had been considerable casualties—scores of deaths and many wounded, plus others who had sustained trench foot and had been evacuated.

As we reconstituted, it was evident that the men were visibly exhausted by their ordeal and wanted sleep above all. Finally, on Christmas Day, the 159th pulled out of Luxembourg City and moved back to the Belgian–French border at Charleville–Messincourt. The cooks did a commendable job putting together a Christmas meal that we ate in the courtyard of the chateau where we were quartered. Of course, there was a great deal of conversation about what had just happened. Everyone was very upbeat, though still mourning the loss of so many friends. As it began to get dark, an American Cadillac sedan, painted OD, pulled up. When I saw the two stars on the bumper plaque, I knew we had an important visitor. It turned out to be Major General William "Wild Bill" Donovan, commander of the Office of Strategic Services (OSS), World War I Medal of Honor recipient, and (later) father of the CIA. It was not safe to be out on strange roads once night fell, and he was traveling without a convoy, so it made sense for him to join us and have a good dinner. At that time, the leading edge of the battlefield was still very fluid, and great caution had to be exercised at all times. We had all heard about English-speaking German soldiers wearing American uniforms who had been circulating behind our lines. Many of them were caught and executed as spies, but we were still uneasy and on guard. Memorizing the challenge and password took on greater importance.

The 159th stayed in the area for several days, regrouping and waiting for our next assignment. Right after the new year, we started to push back into Belgium. The battles and tremendously heavy traffic had taken their toll on the roads. Many of them had almost disappeared, and heavy maintenance and rebuilding had to start at once so the Allies could continue the advance. We were headed back to the Bastogne area, which the 101st Airborne Division had defended so valiantly. Maintenance became a 24-hour-a-day job, and the 159th did many innovative things to expedite the work. For example, we took over sawmills and cut many logs and operated a rock quarry to get materials. We were shorthanded because of the losses we had suffered, but everyone pitched in to accomplish the job. By January 17, the battalion reached Bastogne and started to help clear roads there. We stayed in most locations for a few days and, as the American Army retook the Bulge territory, we kept moving eastward toward Germany. This was to be our pattern of operations during that time. Some of our wounded GIs returned as they recovered during hospital stays. Many had left the hospitals and found their way back on their own, so great was their desire to rejoin their comrades.

On January 31, Headquarters and Service Company pulled into Trois Vierges, a small town almost on the German border at the northern tip of Luxembourg. Although the Germans had occupied it, the town was not too heavily damaged. We moved into several houses and went about our work. Many of the inhabitants returned upon our arrival, and we tried to make them as comfortable as possible. The Germans, however, were not about to leave the matter there. There was quite a bit of water in the streets, but the billets were still dry. Then the Germans opened a dam and the water came flooding into Trois Vierges, forcing us into a hasty relocation.

We moved to Steffeshausen, Belgium, and using this area as our base of operations, began the engineering work needed throughout the area. The main job was restoring the roads, which were still in a terrible state. Frankly, those roads hadn't been designed to withstand the heavy traffic of an army at war. The 159th was working on a 24-hour schedule to accomplish its task, and even the clerks had to help out in cutting down and hauling trees for corduroy roads. One work detail had a visit from General George S. Patton while he was on an inspection tour. The battalion was completely immersed in backbreaking engineering tasks, and working under extremely difficult conditions. The weather was still bad with frequent snow, which caused many weather-related casualties.

In addition to *Stars and Stripes*, we also got *Yank*, a magazine all about Army life, as well as paperback editions of books and overseas editions of various magazines, such as *Life*. It was a pleasure reading *Life*, because it contained only pictures and print stories, but no advertising. Of course, we lived under blackout conditions at all times, but we had generators, so we had lights when there was no local lighting. Our battalion was also lucky, because one of its missions was to provide fresh water for the outfits in our area. We even rigged up a portable shower we could use when we were in one spot for several days.

After the Battle of the Bulge, forward progress became very slow. The Germans had retreated behind their Siegfried Line, and our commanders in this area were content to wait for the right moment before launching any major operations. We knew we would have to get across both the Moselle and Rhine Rivers, both formidable tasks. In the meantime, we prepared the roads and bridges so we had good movement in our own area.

Finally, the time came to advance into Germany proper from our area along the Belgian–Luxembourg border. Company A crossed into Germany on February 23, and the other companies followed by early March. We were in what amounted to a backwater section of the country; it was not heavily populated, and what few towns were there had been virtually destroyed in the fighting and bombing. Our immediate objective was to proceed to the Koblenz area so we could prepare to cross the rivers. On March 15, we were in Mulheim, preparing to take the 87th Infantry Division across the Moselle and to erect a pontoon bridge for permanent access. As with all the bridges we built, we placed a sign at the entrance of the bridge notifying all concerned that they were crossing courtesy of the 159th Engineer Combat Battalion. The only thing we didn't do, unfortunately, was charge a toll.

The next objective was the crossing and bridging of the mighty Rhine—the largest natural barrier we had to overcome. We were in Boppard, on the west bank of the river, on March 26. The mission, again, was to take the 87th Infantry Division across in assault boats, then erect a pontoon bridge. The battalion accomplished its mission, this time under heavy fire, and the American Army was then on the west bank of the Rhine in another sector. Now the Army was ready to really roll eastward across Germany.

Once across the Rhine, we found German resistance becoming more sporadic. The 159th was attached to various infantry divisions, and we followed closely as they continued their relentless push. We did stay in Boppard for several days, seeing to it that the new bridge was properly maintained, and by April 1 we were in Kamp. This was to be one of many one- and two-night stands during the march eastward. We would attend to whatever maintenance needed to be done and assist in rounding up the great numbers of German soldiers who were surrendering. On April 12, we were in the small town of Friedwald when we got word that President Franklin Roosevelt had died. We were in a state of disbelief, because most of us had known no other president. He had been a figure larger than life, and we wondered about his successor, Harry S. Truman.

The battalion was assigned to do military government work as we pushed through Thuringia. Most of the small towns were relatively intact, since no battles had taken place there; the larger cities had been the targets. I recall the town of Konigsee, a small resort area with several hotels. The German civilians who had been fleeing our advance seemed to collect

Operations had more or less come to a halt in our area. We had been in Apolda, Germany, for several days, when I met a commercial photographer who saw me taking pictures in a park across from the building in which we were living. Since I spoke German, we had a conversation, and he told me that he had a photo studio. He offered to take a photo of me and my fellow GIs. May 1, 1945

there because of the available facilities. We worked with the bürgermeister (mayor), telling him what the rules were to be. The Germans were resigned to their fate by this time and, while they were sullen, they did not cause trouble. They obeyed our orders, turning in all their weapons at the town hall. We saw large numbers of displaced persons or refugees wandering the roads. They were real victims of the Germans, and it was heartbreaking to watch them trudging along, with all their belongings on their backs or in rickety carts. I suspected that to them it made no difference whether their circumstances were the result of totalitarianism or liberty. War is ugly, cruel, and indiscriminate, regardless of the motives.

By April 21, we had reached Weimar. The center of the city had sustained some damage, but the area seemed to have survived quite well. It was here that we came upon Buchenwald Concentration Camp. The sights there were beyond comprehension. Some of the former prisoners were still there in their striped outfits. Everyone seemed to be on the verge of death. Wasted bodies were all over the place, many of them stacked on carts. It was a sight that sickened all the American Soldiers. How could human beings inflict such brutality on these people? It was a question we all asked one another. Regrettably, the horrific scene was repeated in many locations throughout Europe.

It was now May 8—Victory in Europe (VE) Day. When we reached Verviers, the Belgians were celebrating the end of the war in Europe. The next morning, a few of us boarded a train for our long-awaited rest and recuperation (R&R) trip to Paris. It was a very slow ride, because the roadbeds were still not fully ready for heavy-duty traffic. We pulled into the Gare du Nord (north station) in early afternoon and were lined up and assigned to our hotels. I was sent to the Elysee Hotel, a small walk-up building across the Rue de 1'Elysee from the presidential home, the Elysee Palace. To top it off, the American embassy was around the corner. It was a great location, but the wonder was how this hotel got there. Who could complain, considering the circumstances?

It was a sunny afternoon, and the weather remained good for our three-day stay. But like all good things, our trip came to an end much too soon, and we were back on the train to Verviers. We stayed in the same Belgian army barracks we had used on the way to Paris. We were thankful that this time things were much quieter. The next morning we were back on our truck for the long ride back to eastern Germany. The trip had many detours, because many of the bridges on the autobahns had been destroyed. We thought we were heading back to Erfurt and then Apolda, but we were told that the battalion was no longer there but was now living in tents near Werda and the Czechoslovakian border. What a comedown! It was a rather rude shock after our trip to Paris.

We went back to doing military government work, and in our trips around the area, we still saw the long lines of refugees and German soldiers walking along. When we talked to the German civilians, we were all struck by the fact that they all claimed not to have been Nazis. We just never met Nazis. It made us wonder who was doing all that shooting at us if no one was a Nazi.

We soon found out that our battalion had been assigned to Antwerp, Belgium, to erect a troop redeployment center. With the war in Europe over, much of the Army had to be sent to the Asiatic–Pacific Theater to help end the war there. It sounded like a good assignment and, while some units were being marked for disbanding, it would keep us all together. On May 31, the battalion loaded up and moved out for the two-day overland journey to Antwerp. We stayed on the autobahns for the most part, but there were detours because of destroyed bridges. We frequently saw hordes of displaced people and German soldiers moving along. We also saw large barbed-wire enclosures holding German soldiers who had become prisoners of war (POWs).

Outside of Cologne, I could see the twin towers of its famous church. We came through Heerlen, the Netherlands, and soon we were in eastern Belgium. Late that afternoon, we arrived in Antwerp. We were directed to a large open area near the Scheldt River. The next day the battalion began to erect a large tent city that would accommodate thousands of troops. This was to be a tremendous task, and we even had the assistance of many German POWs who had been put to work. The tent city, named *Camp Tophat*, was located within the city of Antwerp but in a section called the *other side*, meaning that it was on the opposite side of the river from the developed old city. There was a tunnel that connected the two sections, and we always needed transportation to get into the main part of the city, the second-largest city in Belgium. The port along the Scheldt was one of the largest in Europe. The city had been a target of Hitler's V-l and V-2 revenge weapons. You could see sporadic damage throughout the city where the bombs and rockets had landed, but the damage didn't compare to what we had seen in Germany.

Our Personnel Section kept busy with all the paperwork that had to be done. The Army announced a point system so that those who had been in the Army longest would have an opportunity to be discharged. We had some high-point men, but the majority—including me—were not qualified for quick release. At that time, we considered ourselves fortunate to have accumulated five battle stars, each worth five points, for the campaigns we had been through. The possibility of being sent to the Pacific loomed large in our minds but, in the meantime, we did our everyday work and took advantage of the fact that we were in a lively city with much to offer. It was a simple matter for the men to get into the city, as there were no real restrictions on passes—you just waited for one of the trucks headed that way. Getting back was equally easy.

I found that we were permitted to visit the capital city of Brussels, which was only a half-hour train ride away. I made several trips there, always with my camera at the ready. Brussels had been declared an "open city," so it came through the war intact. The only obvious exception was the missing dome on the gigantic Palace of Justice. Brussels is a flat city,

so the Germans had installed their radar in the dome of the building. When they retreated, they put thermite bombs in the dome and exploded them. The metal dome melted into the building and caused great damage to the central part of the edifice.

One of our main topics of everyday conversation was our possible destination after Antwerp. We received word that the 159th was scheduled to be disbanded at some point. We did lose some high-point men, but we no longer received replacements. We did our daily work, finishing Camp Tophat and awaiting its occupants. We followed the events unfolding in the Pacific, sure that most of us would end up there to finally bring closure to the war. Then, on August 6, we heard about the dropping of the atomic bomb on Hiroshima, followed three days later by the bomb on Nagasaki, and it looked like this would end the war. We were surprised the Japanese didn't surrender at once, but it was not in their makeup to do so. Finally, on August 15, Victory Over Japan (VJ) Day was proclaimed. The war had come to a successful conclusion. Many plans were going to be changed, mine included.

On August 19, orders were issued for my transfer to the 2d Military Government Regiment, headquartered in Bad Homburg, Germany. I was really shocked, as I had completely forgotten about my application for transfer to military government. Who would think the Army would find a lowly PFC and order his individual movement? But it happened, and at this late stage of the game, I was not too happy. My biggest worry was that members of military government would be declared essential and would not be able to go home on schedule. But there was nothing to be done except to make the move, and on August 26, I boarded a train that would travel through Brussels and Paris and take me back to Germany and my new assignment.

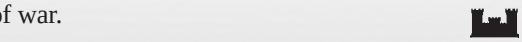
Although my job was interesting, and I had an opportunity to travel in and around the area, I anxiously waited for my turn to go home. My point score was nearing the right total for a trip back to the United States and, at the end of October, orders transferring me to the homeward-bound 29th Infantry Division came through. When I reached division headquarters, I was sent to the 111th Field Artillery Battalion located in Nordenham, across the river from Bremerhaven on the northern coast of Germany.

Finally, word came through that we would be sailing at 1800 hours on January 1, 1946—a wonderful way to start the new year. We had only a short ride to board our C2 freighter *Bienville*, which was larger than the Liberty and Victory ships, but had the same type of accommodations. The ship had four-tier bunks, and I was on the bottom. We all went up on deck to watch the departure from the dock, then we sailed down the Weser River to the English Channel. The trip was supposed to take 10 days to our destination of New York. After days of storms, the weather finally turned nice, but then most of the ship's engines broke down. The *Bienville* barely moved along, and the trip stretched to 15 days.

There were the usual conversations about going home and what that meant. Many dreams were coming to the fore, along with doses of nostalgia. It was a happy time, after all these men had gone through, to reach this point. Finally, the *Bienville* limped into New York Harbor and made its way to a pier in Staten Island. It was early in the morning of January 15, and it didn't take long to get our belongings together and get off the ship. We were transported to Camp Kilmer, New Jersey, a large camp that only handled troops coming back or going out through the Port of New York.

At Camp Kilmer, we went through a series of medical examinations and interviews, and before long, I was on my way to Fort Dix, New Jersey, to undergo the final processing for my discharge. We turned in our extra uniforms and equipment and packed our duffel bags for the last time with whatever was left. Finally, we were given our discharge papers and final pay.

I took a bus to the train station in Trenton, New Jersey, and waited for the train to New York. It was quite a treat to look out the window and see the American landscape again after 19 months overseas. When we reached Pennsylvania Station, a group of us took a cab to Grand Central Station. Now I was in familiar territory, and I proceeded to the New Haven Railroad train to New Rochelle. I knew my mother and father would be waiting for me in the store on Main Street. Because I had the duffel bag, I decided to take a cab from the station instead of walking, as I had always done. In the midafternoon of January 19, 1946, I finally finished my long journey home. It was an exciting and emotional moment when I opened the front door to the store and raced in to greet my mother and father. From Soldier to civilian, I started to put behind me my time as a combat engineer and an eyewitness to the horrors of war.



Mr. Mendelsohn grew up in New Rochelle, New York. His Army experience included basic training at the Fort Belvoir Engineer Replacement Training Center and then assignment to the 159th Engineer Combat Battalion, which was preparing to go overseas. In July 1944, the battalion landed in Normandy and went from there to the German-Czechoslovakian border in May 1945. After discharge from the Army, he returned to the family's retail business, where he remained and expanded the business. He took part in many civic and business activities through the years. Now retired and living in Greensboro, North Carolina, he is one of the few survivors of the 159th Engineer Combat Battalion's Headquarters and Service Company that saw action in the Battle of the Bulge.

Dr. Hennen served on active duty as a military policeman and military intelligence officer, retiring in 1997. Since that time, he has been the headmaster at New York Military Academy in Cornwall-on-Hudson, New York.

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Note: Mr. Mendelsohn was interviewed by Max Hastings for his book *Armageddon: The Battle for Germany*, which was published in 2004.

Engineer Update

Transition from ARTEP/MTPs to CATS. The U.S. Army has transitioned from using the Army Training and Evaluation Program (ARTEP) mission training plans (MTPs) as a collective training tool to using the combined arms training strategy (CATS). A CATS is a unit training strategy which, as an entity, takes the entire training planning process from the cradle to the grave. A CATS is developed from a unit's base table of organization and equipment (TOE) and Department of the Army-approved mission statement. They are designed using the training model of crawl-walk-run. Commanders will make the final determination as to which tasks should be trained and at what level the training should begin, since they will know their unit's training status. Included in CATS are the required training resources such as Class III and Class V materials and training aids, devices, simulators, and simulations (TADSS). The current ARTEP/ MTPs that are located on the Reimer Digital Library (RDL) are scheduled to be removed from the RDL (TBD). CATS are located on Army Knowledge Online (AKO) on their own dedicated page. The planned end state is movement of CATS to the Digital Training Management System (DTMS) once it is fully fielded. Additionally, the Collective Training Division of the United States Army Engineer School developed a website on the Engineer Portal that will also have links to CATS and files available for download. The following links will take you to the AKO CATS site and to the Engineer Portal.

AKO CATS Link: <*https://Army Knowledge Online*>.

Engineer Portal Link: <*https://www.mwu.army.mil/portal/eng/index.php*>.

The point of contact at the Engineer School Collective Training Division is <*donald.durst@us.army.mil*> or call (573) 563-6237.

Engineer Doctrine Contact Update. As of 15 August 2007, the Engineer School's Doctrine Division was consolidated at the Maneuver Support Center (MANSCEN) level to the MANSCEN Directorate of Training (MDoT) Doctrine Division. The Engineer Doctrine element still retains the lead for the Regiment's doctrine with only a few minor changes in physical locations and contact information.

The mailing address for written correspondence has changed to: Commandant, United States Army Engineer School, ATTN: ATZT-TDD-E, 320 MANSCEN Loop, Suite 220, Fort Leonard Wood, Missouri 65473-8929. The telephone numbers remain the same: Doctrine Chief, (573) 563-8161; Senior Doctrine Analyst, (573) 563-7332 (DSN prefix, 676-).

The generic NIPR e-mail address for electronic correspondence has changed to <*leon.mdottddengdoc@conus.army.mil*>.

Engineer School Lessons Learned Integration (L2I) Cell. The United States Army Engineer School L2I Cell needs your help. To keep training, doctrine, and combat developments current and to prepare for the future, it is critical that the school continuously receive relevant engineer observations, insights, and lessons (OIL). The L2I analyst can derive information from a variety of sources: unit after-action reports (AARs); tactics, techniques, and procedures (TTPs) used by units in and returning from theater; Soldier observations/submissions to the Engineer School; and requests for information (RFIs). This information is used to conduct doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) gap analyses and to determine solutions. These solutions are distributed to the Engineer Regiment via new doctrine and training products, Engineer (The Professional Bulletin of Army Engineers) and other publications, websites, and by answering RFIs. With the modular transformation in full swing, many engineer units are looking for sample tactical standard operating procedures (TACSOPs) for the new units being established. You can help by forwarding any of these materials from your unit's deployment to the L2I analyst. Unclassified information can be sent to <*michael.e.meyer@us.army.mil*>. Classified information can be sent by secure Internet protocol, routed (SIPR) e-mail to <*michael.meyer@us.army.smil.mil*>. For more information, call (573) 563-3820.

2008 Engineer Unit Directory. The 2008 United States Army Engineer Unit Directory is available online in Adobe PDF format at <*http://www.wood.army.mil/engrmag/Engr%20Unit%20Dir/2007Directoryonline.pdf*>. Since many unit addresses have changed recently, take a moment and see if your unit's listing is correct. Changes to the Unit Directory can be made by calling (573) 563-7644 or e-mailing <*leon.engineer@conus.army.mil*>.

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