

'We Need More Engineers'

By **LTG Mark Hertling, LTC William Graham** and **MAJ Louis Florence**

The Army has gone through a tremendous metamorphosis since September 11, 2001. Combat operations in Iraq and Afghanistan have proven the value of many of these changes. These full spectrum combat operations, however, have also exposed some serious flaws, particularly the lack of adequate engineer support.

By design, the Army transformation initiative resulted in engineer forces organic to the transformed brigade combat teams (BCTs) that proved insufficient. The modular BCTs were only resourced with the organic engineer capacity to conduct terrain analysis, build protective positions, and conduct initial breaching and route-reconnaissance operations. All other engineer support was to come from the echelon above brigade (EAB) modular force pool based on the specific requirements of the BCT's mission.

When serving as Multinational Division-North (MND-N) during Operation Iraqi Freedom, 1st Armored Division leaders quickly realized that they didn't have enough engineers. Each BCT came to the fight with only a single organic engineer company. These engineers, combined with the two EAB engineer battalions assigned to the division's attached engineer brigade, were already overtasked with conducting their vital offensive and defensive missions. Add to this the critical role engineers play in the conduct of stability operations, and it became apparent that we were running out of engineer troops long before we ran out of engineer tasks. As a result, the division could not provide the BCTs with sufficient engineer augmentation they required to execute full spectrum operations.

Troop-to-Task Analysis

To understand exactly where our engineer shortfalls were, we conducted an unconstrained troop-to-task analysis. The following is a broad list of the typical engineering tasks that we determined were required by each BCT. These obviously varied depending on the security, governmental and economic situation in each BCT's area of operations.

- *Combat engineer tasks:* Route clearance, route reconnaissance, explosive-area search, sensitive-site exploitation, cache destruction, dynamic building entry, minefield/improvised explosive device (IED) breaching and assault gap crossing.
- *Construction engineer tasks:* Route sanitation, rapid crater repair, base camp/combat outpost construction, protective-position construction/inspection, barrier emplacement/inspection, culvert denial operations, quality-of-life upgrades, electrical-safety quality control and contract management.
- *Engineer tasks in support of stability operations:* Training of Iraqi army engineers, critical infrastructure repair, restoration of essential services, civil-capacity development, economic revitalization efforts and project management.
- *Geospatial engineering tasks:* Geospatial intelligence operations and terrain analysis.

Applying the right engineer units against these tasks required providing each BCT with a mix of three to five additional combat and construction engineer companies. The BCTs also required more staff support to enable them to properly plan and coordinate all of these tasks. In particular, engineer tasks in support of stability operations involved a significant amount of brigade-staff action to devise and implement.

Command and Control

The final step in our troop-to-task analysis was to overlay the necessary level of command and control. In accordance with the modular doctrine in Field Manual (FM) 3-90.61 *The Brigade Special Troops Battalion*, we first looked at assigning the required engineer companies to the brigade special troops battalions (BSTBs). In MND-N, however, some of the BSTBs were committed as operational environment owners, some were fully engaged with missions such as mayors' cell/base defense, and some BCTs simply didn't have BSTBs. Nevertheless, three to five additional engineer companies would have exceeded the span of control abilities of the BSTBs and would not have provided the desired increase in brigade-level staff support. Likewise, we believed that allowing the BCTs to assign the required engineer companies down to the combined arms battalions would have overtaxed these fully committed battalions. We concluded, therefore, that each BCT required an engineer battalion headquarters to command and control the additional engineer companies and integrate them into BCT operations.

Our conclusion that each BCT needs the support of an engineer battalion with a mix of different engineer units is in lockstep with modular doctrine. According to FM 3-90.61: “During offensive and defensive operations, a BCT should receive an engineer battalion headquarters with [a mix of various engineer companies].” Given the Army’s recent recognition of the need to conduct full spectrum operations and the substantial role that engineers have in the successful conduct of stability operations, one can argue that all BCTs deployed to conduct full spectrum operations require augmentation by a battalion-size engineer force.

The troop-to-task analysis confirmed that the division’s engineer brigade didn’t have enough forces to provide the necessary level of EAB engineer augmentation to the BCTs. Because of this shortfall, the division turned to Multi-National Corps-Iraq (MNC-I) for additional engineer forces.

Engineer Work Line

The MNC-I staff engineer and the commander of the 20th Engineer Brigade (MNC-I’s engineer brigade) readily understood the requirement for additional engineer support in MND-N, inventively applying existing doctrine that allows corps to delineate a portion of a division’s area of operations where corps units can provide the required engineer support. The graphic control measure used to delineate this boundary is labeled the *engineer work line* (EWL). Using this construct, MNC-I set an EWL that gave the 20th Engineer Brigade responsibility to provide engineer support to two of the four maneuver BCTs in MND-N; MNC-I then gave the 1st Armored Division direct tasking authority over corps engineer forces working within the EWL.

The EWL arrangement with MNC-I finally allowed MND-N to provide its BCTs with the proper level of engineer support. MND-N reconfigured its two EAB engineer battalions into multifunctional battalions composed of both combat and construction engineer companies, as determined by the tasks the battalion was required to perform. These two battalions, combined with two existing multifunctional engineer battalions from the 20th Engineer Brigade, allowed the division to place in support of each maneuver BCT an EAB engineer battalion consisting of an engineer lieutenant-colonel commander, a full battalion staff, and the right mix of combat and construction engineer companies.

Provincial and Urban Success

Having a multifunctional engineer battalion supporting each BCT worked. In Mosul and in Ninewa Province, the tireless 94th Engineer Battalion teamed with the 3rd Armored Cavalry Regiment, rapidly established combat outposts throughout the city to “clear and hold” areas of insurgents and quickly built battalion-size life-support areas. In Kirkuk, the rugged 14th Engineer Battalion proved invaluable to the efforts of the 1st BCT, 10th Mountain Division, to hold critical areas of the Rashad Valley and strengthen its vital stability operations in and around the city. In Salah ad Din Province, the resourceful 326th Engineer Battalion provided the 1st BCT, 101st Airborne Division, with critical engineer augmentation that helped its vast economy-of-force mission progress from perpetual clearance operations to holding, and even building, operations. In the ethnically split Diyala Province, the 5th Engineer Battalion fought alongside the 2nd Stryker Cavalry Regiment (and subsequently the 1st Stryker Brigade Combat Team, 25th Infantry Division), providing the mobility and basing support that was essential to hold the cities of Baqubah and Muqadiyah while simultaneously pursuing the enemy into their rural support zones.

These efforts, combined with the critical oversight of the engineer brigades and the magnificent work of the engineer companies organic to the BCTs, demonstrated just what engineers were capable of achieving on the full spectrum battlefield—provided, that is, there were enough of them.

Clearly, the modular BCTs’ full spectrum engineering requirements far exceed both their meager organic engineer capabilities and the command-and-control capacity of their BSTBs. One only has to look at the ubiquitous IED threats, the numerous basing and force-protection requirements, and the critical contributions of engineers to stability and civil-support operations to understand this. By crafting a scheme of engineer operations that gave each BCT the support of an entire engineer battalion, the 1st Armored Division was able to achieve remarkable results.

Given our experience, we believe that the Army must improve its ability to provide sufficient EAB engineer forces to meet the augmentation requirements of the modular BCTs (which we believe amounts to one multifunctional engineer battalion per BCT). We can no longer afford for the BCTs to be underresourced with engineers. These are not simply “nice-to-have” forces—they are mission-critical needs that must be available to achieve success on the battlefield. To do this, sufficient engineer forces have to be available in the force pool, and combatant commands must ensure that they secure these engineer forces in adequate numbers and types to properly support their deploying BCTs. Simply put, we need more engineers.

LTG Mark Hertling served as the commander of Multinational Division-North (MND-N) and the 1st Armored Division (1AD) during Operation Iraqi Freedom (OIF) from 2007–09. He is currently deputy commanding general, Initial Military Training, U.S. Army Training and Doctrine Command. **LTC William Graham** was the 1AD division engineer during OIF from 2007–09. He is the Army War College Fellow assigned to MIT's Security Studies program. **MAJ Louis Florence**, who served as the deputy division engineer for 1AD during OIF from 2007–09, is pursuing a Ph.D. in optics at the University of Central Florida.