

Training Engineers With Industry

**A Monograph
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Abstract

TRAINING ENGINEERS WITH INDUSTRY by MAJOR Neil B. Doherty, U.S. Army, 40 pages.

Doctrine requires the Army to conduct full spectrum operations, giving equal consideration to stability operations and Defense Support of Civil Authority (DSCA) with the traditional missions of offense and defense. This shift in doctrine, among other things, requires the Army to review its training and development to meet the new demands.

U.S. Army Engineers have a major role in stability operations. The new doctrine requires engineers to conduct numerous technical tasks in support of stability operations. While these technical skills are not necessarily new to the Regiment, they have not been emphasized in the recent past. The education, training, and development of technical skills were second to the tactical engineering skills required of the Regiment. The Engineer Regiment recognizes it lacks the competency to meet the challenges of the new doctrine and is developing a Building Great Engineers (BGE) campaign plan to address those challenges.

This monograph examines some of the impacts of modifying doctrine to include stability operations and the capability gaps created by this change. Likewise, the Engineer Regiment has stability operations tasks that they are unable to fully support and must develop the capacity to meet those requirements. Industry also plays a critical role in stability operations and that role must be leveraged for the Army, the Engineer Regiment, and the interagency to succeed.

Training with industry (TWI) is an existing program the Army uses to expose its officers to technical and upper level managerial experience in fields that are not available in the military. TWI assigns officers to civilian industries to gain this experience and upon their return to the Army, they implement those skills.

The U.S. Army Engineer Regiment should leverage the existing TWI program to assist in developing the select technical skills of its field grade officers in certain stability operations tasks. While the overall impact of the program will be small in scale, it can be immediate. It can augment existing programs that develop Engineer officers and can assist with other issues of concern for the BGE campaign.

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INTRODUCTION

The U.S. Army, in accordance with the Department of Defense (DoD) Directive Number 3000.5, shifted its doctrine from offense¹ and defense² to full spectrum operations.³ Stability and Defense Support of Civil Authorities (DSCA) operations are now as important as the traditional missions of offense and defense. DoD Directive Number 3000.5, *Military Support for Stability, Security, Transition, and Reconstruction (SSTR) Operations*, states:

Stability operations are a core U.S. military mission that the Department of Defense shall be prepared to conduct and support. They shall be given priority comparable to combat operations and be explicitly addressed and integrated across all DoD activities including doctrine, organizations, training, education exercises, materiel, leadership, personnel facilities, and planning.⁴

The transformation of Army doctrine began in 2001, with the introduction of full spectrum operations, its newest capstone Field Manual (FM) 3-0 codifies stability operations as a component of doctrine. In the foreword of FM 3-0, General William S. Wallace, then Commanding General of the U.S. Army Training and Doctrine Command, describes this shift as “a revolutionary departure from past doctrine.” He continues by describing “an operational concept where commanders employ offensive, defensive, and stability or civil support operations simultaneously....”⁵ This shift in doctrine not only requires a shift in operations but also a shift in the training and development of the Army.

The U.S. Army Engineers are combat engineering oriented; their force structure, education, and training are tailored for combat. The current restructuring of the Army to a

¹ U.S. Department of the Army, *FM 3-0, Operations*, (Washington D.C.: G.P.O., 2008), Glossary. Offensive Operations are defined as “Combat operations conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. They impose the commander’s will on the enemy.”

² Ibid. Defensive Operations are defined as “Combat operations conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive and stability operations.”

³ Ibid. Full Spectrum Operations are defined as “Army forces combine offensive, defensive, and stability or civil support operations simultaneously as part of an interdependent joint force to seize, retain, and exploit the initiative, accepting prudent risk to create opportunities to achieve decisive results.”

⁴ U.S. Department of the Army, "DoD Directives Number 3000.5." *DoD Issuances*, November 28, 2005, <http://www.dtic.mil/whs/directives/corres/pdf/300005p.pdf> (accessed August 26, 2008), 2.

⁵ Army, *FM 3-0, Operations*, Foreword.

modular Brigade Combat Team (BCT)-centric force, dramatically affected the active component (AC) Engineer Regiment. Some of the changes include a smaller AC Engineer Regiment, a shift of units from AC to reserve component (RC), and the elimination of assignments that provide mid-level officers with experiences in tasks directly related to stability operations.

The AC Engineer Regimental force structure focuses on support of major combat operations (MCO) and shifted the preponderance of its construction force to the RC. RC forces are limited by the Army Force Generation (ARFORGEN) cycle which affects the ability of the AC Engineer Regiment to deploy technical units in support of MCO. This shift of construction forces also reduces the number of positions available to AC engineer officers to develop technical skills in construction related tasks. The overall lack of technical developmental positions, therefore, reduces the technical skills and experiences of the Army engineer officer corps. Assignments to the United States Army Corps of Engineers (USACE) Districts and uniformed directors of public works (DPW) positions are examples of assignments that technically develop engineer officers with skills directly transferrable to stability operations. Unfortunately, assignments to USACE are not filled to capacity and the Army eliminated military DPW positions.

While opportunity for technical positions decreased, the requirements for engineer officers to support stability and civil support operations increased. The Engineer support to BCTs, Divisions, and Corps lack the technical capabilities afforded by engineer battalion and brigade staffs. At the operational level, Corps and above, Engineer Commands (ENCOMs) provide theater-wide technical engineer support as well as command and control.⁶ The two ENCOMs in the Army reside in the RC, there is no AC engineer element to fill this role. USACE

⁶ U.S. Department of Defense, *Joint Publication 3-34, Joint Engineer Operations*, (Washington D.C.: G.P.O., 2007), I-6. The engineer command (ENCOM) is designed for operational level command without augmentation of engineer capabilities at echelons above corps level and often will provide command and control (C2) for the JFC if an operational engineer headquarters (HQ) is required.

is currently supporting stability operations using a provisional division, the Gulf Region Division (GRD). However, GRD's staff is civilian heavy and lacks the expeditionary ability of BCTs.

The primary technical engineer support to AC forces in an MCO theater of operations largely depends on the individual technical skills of engineer field grade officers. The requirement for technical support does not end with just the military; the Department of State Provincial Reconstruction Teams (PRTs) require an Engineer Major or Lieutenant Colonel for technical engineering experience.

The Engineer Regiment recognizes that it lacks the technical competencies to meet the growing demands of Army doctrine.⁷ The Regiment recently launched the Building Great Engineers (BGE) campaign with the intent to develop and implement a strategy which "Accesses, Develops, Employs, and Retains world-class engineer leaders who are technically and tactically capable and competent to deliver full spectrum engineering in the 21st Century."⁸ It will take time to develop and implement the BGE strategy. Meanwhile, the Army is in persistent conflict and requires engineer support beyond combat engineering. The Engineer Regiment must quickly develop Majors that have the technical experience to support the Army (and the joint force), USACE, and interagency partners in full spectrum and civil support operations.

The scope of this monograph will examine the Army's stability operations doctrine and the education, training and development of its Engineer Regiment. It will specifically focus on stability operation tasks and the lack of technical education, training, and development of field grade engineer officers in those tasks, as well as how private industry can assist in developing those skills. Other methods, such as accessions or organizational changes, which may assist in reducing the technical competency gap of the Engineer Regiment, are outside the scope of this

⁷ U.S. Army Engineer School, "Building Great Engineers Campaign Plan," (Fort Leonard Wood: U.S. Army Engineer School, 2008), 3.

⁸ Ibid.

monograph. The Engineer Regiment lacks certain technical competencies to satisfy the new doctrinal requirements and therefore must develop methods to technically educate, train, and develop its field grade officers. Partnering with the private sector is a logical way to satisfy a portion of that competency gap related to stability operations. The Regiment can capitalize on the Army's Training with Industry (TWI) program to quickly develop this partnership with the private sector and begin closing the gap.

The BGE campaign is in the process of developing its strategy to respond to the growing lack of technical competencies in the Engineer Regiment. The Regiment realizes the technical skills and experiences of U.S. Army Engineer officers are not adequate to meet the needs of the U.S. Army in the contemporary operating environment nor are they sufficient to executing current Army doctrine. Adopting a TWI approach to partner with the private sector may address only a small portion of this competency gap by providing the education, training, skills and experience necessary for stability operations.

This monograph will explore the doctrine of stability operations and emerging gaps in capabilities. The monograph identifies the major documents that prompted the shift in Army doctrine and the important role civilian agencies perform in stability operations. A study of the manuals the Army developed to meet the new doctrinal requirements reveals tasks that are engineer specific and how those tasks are directly related to emerging gaps for the Army.

Secondly, the monograph will focus on the BGE campaign and what it is trying to accomplish. The BGE campaign has not fully developed a strategy to address the Regiment's concerns. However, the preliminary findings provide useful analysis of the technical competencies required by the Engineer Regiment. A review of the current engineer field grade officer education, training and development shows that the Engineer Regiment is unable to adequately develop its technical requirements. Finally, a closer look at the technical gaps between doctrine and engineer capabilities reinforces the need to reevaluate current education, training, and development.

Thirdly, the monograph will look at the TWI program and its purpose. The TWI program has certain criteria that must be met to participate. The monograph will analyze the current utilization of the program and how various branches receive allocations to participate. Currently, the Engineer Branch does not participate in the program; however, an analysis of the Army regulations and pamphlets indicate that Engineers have a valid argument to participate in the program.

Fourth, the monograph will examine the private sector, as private industry has an important role in stability operations. The monograph will focus on the role private industry plays in the engineering specific areas. Finally, it will look at the role that private industry can fill in preparing the Engineer Regiment for stability operations and how TWI is a program that can facilitate that preparation.

STABILITY OPERATIONS AS DOCTRINE

National Security Presidential Directive (NSPD) 44

National Security Presidential Directive (NSPD) 44, *Management of Interagency Efforts Concerning Reconstruction and Stabilization*, identifies the need for a United States Government (USG) interagency response for reconstruction and stabilization operations. Additionally, it identifies the Department of State (DoS) as the lead agency to coordinate this response. The directive specifically charges the DoS:

- (i) to coordinate and strengthen efforts of the United States Government to prepare, plan for, and conduct reconstruction and stabilization assistance and related activities in a range of situations that require the response capabilities of multiple United States Government entities and (ii) to harmonize such efforts with U.S. military plans and operations.⁹

NSPD 44 also paved the way for the development of the Department of State's Office of the Coordinator for Reconstruction and Stabilization (S/CRS), whose role is to coordinate the reconstruction and stabilization efforts for the United States.

Office of the Coordinator for Reconstruction and Stabilization (S/CRS)

S/CRS mission is to "lead, coordinate, and institutionalize U.S. Government civilian capacity to prevent or prepare for post-conflict situations, and to help stabilize and reconstruct societies in transition from conflict or civil strife so they can reach a sustainable path toward peace, democracy and a market economy."¹⁰ While S/CRS is the lead government agency for stability and reconstruction planning and execution, it recognizes that the military will have a

⁹ George W. Bush, "National Security Presidential Directive 44 (NSPD-44)," *Management of Interagency Efforts Concerning Reconstruction and Stabilization*, (Washington D.C.: The White House, December 7, 2005), 2.

¹⁰ U.S. Department of State, "Office of the Coordinator for Reconstruction and Stabilization Fact Sheet," *U.S. Department of State*, March 8, 2005, <http://www.state.gov/s/crs/rls/43327.htm> (accessed November 15, 2008), 1.

substantial role. In some cases the military will have the lead in execution and will have to transition leadership to S/CRS.¹¹

S/CRS led an interagency working group to develop the Post-Conflict Reconstruction Essential Tasks list. The list identifies five technical areas: Security, Governance and Participation, Humanitarian Assistance and Social Well Being, Economic Stabilization and Infrastructure, and Justice and Reconciliation. The list identifies tasks for each technical area and further categorizes the tasks as initial response with a goal of responding to immediate needs, transformation with a goal of establishing a foundation for development, and fostering sustainability with a goal of institutionalizing long term development programs. The list also identifies tasks that are infrastructure related and these tasks cut across all sectors. The list is intended to be a living a document and had input from the interagency, including DoD and USACE.¹²

DoD and Joint Doctrine: DoD Directive 3000.5 & JP 3-0

DoD Directive 3000.5, *Military Support for Stability, Security, Transition, and Reconstruction (SSTR) Operations*, represents the shift in doctrine at the cabinet level and coincides with NSPD 44, identifying the State Department as the lead agency for reconstruction and stability operations. It defines stability operations as “Military and civilian activities conducted across the spectrum from peace to conflict to establish or maintain order in States and regions.”¹³ Furthermore, the directive states that while many of the stability operations tasks fall

¹¹ Ibid., 2.

¹² U.S. Department of State, "Post-Conflict Reconstruction Essential Tasks," *U.S. Department of State Web site*, April 2005, <http://www.state.gov/documents/organization/53464.pdf> (accessed September 12, 2008), iii.

¹³ U.S. Department of Defense, "DoD Directives Number 3000.5," *DoD Issuances*, November 28, 2005, <http://www.dtic.mil/whs/directives/corres/pdf/300005p.pdf> (accessed August 26, 2008), 2.

under the purview of civilian agencies, “U.S. military forces shall be prepared to perform all tasks necessary to establish or maintain order when civilians cannot do so.”¹⁴

Joint Publication 3-0 (JP 3-0), *Joint Operations*, expands the definition of stability operations as “an overarching term encompassing various military missions, tasks, and activities conducted outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment, provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief.”¹⁵ JP 3-0 also recognizes that civilian agencies may not have the ability or expertise to manage the reconstruction or stabilization effort at a particular time and the military will assume “de-facto lead” in the operation.¹⁶

Army Doctrine: FM 3-0 & FM 3-07

The Army recently published two Field Manuals (FMs) that are significant to stability operations, FM 3-0, *Operations* and FM 3-07, *Stability Operations*. FM 3-0 is significant because it identifies stability operations as a doctrinal task, within full spectrum operations, for the U.S. Army. This is a major shift from just offensive and defensive operations. FM 3-07 provides the doctrinal guidance and direction on how the U.S. Army will conduct stability operations.¹⁷

FM 3-07 incorporates the joint definition (JP 3-0) of stability operations. The manual notes that host nation governments are responsible for the basic needs of its citizens. However, when host nation governments are unable to do this, “military forces provide essential civil services to the local populace until a civil authority or the host nation can provide these

¹⁴ Ibid., 2.

¹⁵ U.S. Department of Defense, *Joint Publication 3-0, Joint Operations*, (Washington D.C.: G.P.O., 2006), GL-29.

¹⁶ Ibid., V-24.

¹⁷ U.S. Department of the Army, *FM 3-07, Stability Operations*, (Washington D.C.: G.P.O., 2008), iv.

services.”¹⁸ This reflects the understanding that the Army may have to provide the stabilization effort until it can transition leadership to S/CRS.

FM 3-07 references S/CRS’s Post-Conflict Reconstruction Essential Tasks (referred to in FM 3-07 as essential stability task matrix) and provides a synopsis of each task. Furthermore, it categorizes stability operations tasks into three types:

- Tasks for which military forces retain primary responsibility.
- Tasks for which civilian agencies or organizations likely retain responsibility, but military forces are prepared to execute.
- Tasks for which civilian agencies or organizations retain primary responsibility.¹⁹

The manual focuses on those tasks that the military will or may perform while excluding the tasks specifically identified for civilian agencies. Two of the tasks that require significant engineer support are a) *Restore Essential Services* and b) *Support to Economic and Infrastructure Development*.²⁰

The task *Restore Essential Services* goes beyond providing services for the immediate needs of a population. Essential services are those civil services which are required for a society to function. They are the responsibility of the host nation’s government. The initial efforts in restoring these services are the foundation for more sophisticated efforts to build upon. These efforts must be scaled properly to local capacity so as not overwhelm the population and worsen the situation.²¹

A subtask of *Restore Essential Services* is *Provide Essential Civil Service*. *Provide Essential Service* “involve(s) developing the capacity to operate, maintain, and improve” essential services.²² FM 3-07 provides examples of essential tasks that include:

¹⁸ Ibid., 2-2.

¹⁹ Ibid., 3-2.

²⁰ Center for Army Lessons Learned (CALL), *Engineer Operations Operation Iraqi Freedom August-September 2008*, (Collection and Analysis Team (CAAT) Report, Fort Leavenworth: Center for Army Lessons Learned, 2008), 4.

²¹ Army, *FM 3-07, Stability Operations*, 3-9.

²² Ibid.

- An initial response in which military forces—
 - Provide for immediate humanitarian needs of the population (food, water, shelter, and medical support).
 - Ensure proper sanitation, purification, and distribution of drinking water.
 - Provide interim sanitation, wastewater, and waste disposal services.
- Transformation in which military forces build host-nation capacity to operate and maintain essential civil services.²³

The manual identifies the possibility of military functional units or specialists to provide support for this subtask by conducting infrastructure reconnaissance.

Support to Economic and Infrastructure Development has two subtasks that involve engineering efforts. *Restore Transportation Infrastructure* and *Support General Infrastructure Reconstruction Programs*. The task for transportation infrastructure requires assessments of national transportation infrastructure (roads, bridges, airports, harbors, waterways etc.). It also requires prioritizing projects and conducting expedient repairs of facilities.²⁴

Support General Infrastructure Reconstruction Programs involves “rehabilitating the state’s ability to produce and distribute fossil fuels, generate electrical power, exercise engineering and construction support, and provide municipal and other services to the populace.”²⁵ The manual refers to USACE as having the expertise to administer these projects.

Emerging Gaps Between Doctrine and Capabilities

The major shift in doctrine, from offensive and defensive operations to full spectrum operations, as demonstrated, creates gaps in the abilities of the Armed Forces. Forces trained to fight and win the nation’s wars are now, officially, being called on to conduct stability operations or nation building. This change in doctrine requires corresponding changes in the capabilities of the Armed Forces.

²³ Ibid., 3-10.

²⁴ Ibid., 3-18.

²⁵ Ibid., 3-18.

The Army identified numerous gaps and the majority of them fall under tasks that the Army would normally support a Joint Interagency Intergovernmental Multinational (JIIM) approach. However, because the Army must be prepared to conduct all tasks independently, it is important to identify the gaps and develop a response to reduce them.²⁶ One example of an identified gap is: “A shortfall in the Army’s ability to conduct appropriately scaled repair/restoration operations as an initial response to provide essential services (e.g. electricity, telecommunications, waste treatment) or to facilitate economic activity (e.g. port dredging, railway repair, indigenous enterprise creation).”²⁷

Full spectrum operations require the Army to pay equal amount of attention to SSTR. SSTR requires substantial support from combat support and combat service support units. The U.S. Army Engineer Regiment has a substantial role in SSTR.²⁸ As is evident from reviewing a few of the tasks identified by FM 3-07, engineer support is critical in restoring essential services, repairing critical infrastructure, and transitioning to civil control. These are only the tasks that are primarily for military forces or may be performed by military forces. The third category, tasks performed by civilian agencies, was not analyzed. However, as shown in every document from NSPD 44 to FM 3-07, it is important and necessary for military forces to have the capability to conduct stability operations independently until civilian forces can enter the area.

²⁶ U.S. Department of the Army, "Stability Operations in an Era of Persistent Conflict," (Army White Paper, Washington D.C., 2008), 15.

²⁷ Ibid.

²⁸ Roger A. Wilson Jr., Colonel, *Campaign Quality Gap: Developing Strategic Engineering Competency*, (Strategy Research Project, Pennsylvania: U.S. Army War College, 2007), 1.

ENGINEER OFFICERS AND STABILITY OPERATIONS

Building Great Engineers (BGE) Campaign

The Engineer Regiment recognizes it lacks the technical competency to meet the demands the new doctrine places on the Army.

The Chief of Engineers has received several indications that Engineer Leader Technical Competency has declined. Several events have increased the requirement for military engineer technical skills, e.g., Katrina response; engineer support to the War on Terrorism; and a Department of Defense mandate increasing the importance of stability operations. As requirements increase, decreases in technical competency as illustrated in reduced technical engineering assignments, a shift towards a sapper mentality in the Regiment, and findings listed below indicate this decline may cross multiple levels of both civilian and military leadership.²⁹

In response, the Engineer Regiment recently launched the Building Great Engineers (BGE) Campaign with the intent to develop and implement a strategy that “Accesses, Develops, Employs and Retains world-class engineer leaders who are technically and tactically capable and competent to deliver full spectrum engineering in the 21st century.”³⁰

BGE Structure and Initiatives

The BGE Campaign plan was developed in response to the declining proficiency in technical skills of the U.S. Army Engineer Regiment. The objective of the campaign is to recruit, educate, train, and retain engineer leaders who are technically competent to meet the needs of the Army during full spectrum operations.³¹ BGE is organized into six working groups to investigate deficiencies and recommend new initiatives, the six groups are: Accessions, Retention, Employment, Strategic Communications, Training and Education, and Futures.

The Accessions working group is focused on increasing the number of Engineer officers with undergraduate degrees in science and engineering. The population of degreed engineers in

²⁹ U.S. Army Engineer School, "Building Great Engineers Campaign Plan," 3.

³⁰ Ibid.

³¹ Ibid.

the Engineer Regiment has steadily declined from 54% in 1998 to 28% in 2007.³² This decline in technically educated officers was not thought significant during the transition to a modular force and a combat engineering focused regiment. However, with the change in doctrine and an increase operational tempo this decline is now significant.

The Retention working group is focused on retaining the right officers for advancement in the Regiment. They are investigating incentives, such as Professional Engineer licensing and civilian technical training. The group is exploring innovative ways to evolve the Regiment's leadership/mentorship programs to better adjust to the Army's modularity. The group is also investigating flexible career paths such as moving from the AC to the RC.³³

The Employment working group is focused on developing a program to employ the "right person, in the right job, at the right time."³⁴ The group is reviewing initiatives that alter the current career management path and a system for tracking individual engineers that have specific competencies. They are also trying to develop a career path that has professional requirements tied to promotions and positions. This process would be similar to military education requirements for promotion gates. They are also investigating ways to reduce the number of branch immaterial positions for engineers and allow degreed engineers to fill technical positions that give them experience and training in their fields.

The Strategic Communications working group is developing methods to market the campaign plan to both current engineer officers and potential recruits. Their goal is to market the plan to the Engineer Regiment as a long term project that increases the technical skills of the regiment but not at the expense of non-degreed engineer officers. They are also developing a coordinated recruiting plan to attract degreed engineers to the Regiment.³⁵

³² Ibid., 4.

³³ Ibid., 8.

³⁴ Ibid., 10.

³⁵ Ibid., 14.

The Training and Education working group's objective is to develop engineer officers with the appropriate balance among general,³⁶ combat,³⁷ and geospatial engineering.³⁸ Currently, Navy and Air Force engineers are more sought after by Joint Commanders because they have more experience and training in jobs that are better suited for stability operations.³⁹ The intent is to leverage the existing training infrastructure while improve the level of instruction at the U.S. Army Engineer School. The group is investigating methods of increasing the number of professional certifications and opportunities for advanced technical degrees.⁴⁰

The Futures group is focused on improving the regiment to meet the needs of the modular Army. They are looking at engineer staff structure at all levels of the Army and synchronization with other branches to reduce redundancy. They are also investigating a form of low density skill management process and creating new mission requirements, such as Capacity Development (for stability operations). They are also reviewing the feasibility of returning/increasing DPW, USACE, and other technical positions back to the Engineer Regiment.⁴¹

The six working groups are developing initiatives to meet the goals of the BGE campaign. They recognize these initiatives will take time to develop and implement. They also recognize the importance of individual group initiatives supporting the strategies of the other five

³⁶ U.S. Department of Defense, *Joint Publication 3-34, Joint Engineer Operations*, GL-10. “**general engineering.** Those engineering capabilities and activities, other than combat engineering, that modify, maintain, or protect the physical environment. Examples include: the construction, repair, maintenance, and operation of infrastructure, facilities, lines of communication and bases; terrain modification and repair; and selected explosive hazard activities. Also called GE.”

³⁷ U.S. Department of Defense, *Joint Publication 3-34, Joint Engineer Operations*, GL-8. “**combat engineering.** Those engineering capabilities and activities that support the maneuver of land combat forces and that require close support to those forces. Combat engineering consists of three types of capabilities and activities: mobility, countermobility, and survivability.”

³⁸ U.S. Department of Defense, *Joint Publication 3-34, Joint Engineer Operations*, GL-10. “**geospatial engineering.** Those engineering capabilities and activities that contribute to a clear understanding of the physical environment by providing geospatial information and services to commanders and staffs. Examples include: terrain analyses, terrain visualization, digitized terrain products, nonstandard tailored map products, precision survey, geospatial data management, baseline survey data, and force beddown analysis.”

³⁹ U.S. Army Engineer School, "Building Great Engineers Campaign Plan," 17.

⁴⁰ Ibid.

⁴¹ Ibid., 22.

groups. The BGE campaign will succeed by adopting initiatives that cut across the strategies of all six working groups.

Engineer Technical Skills

The BGE campaign is still conducting studies and research; however some preliminary findings attempt to identify what technical skills are required and how the Regiment can cultivate the experience necessary to meet the demands. The Employment working group proposed four definitions for Engineer officers and then classified them.⁴² The four categories of engineers are: Military Engineer,⁴³ Project Engineer, Program Engineer, and Technical Engineer.⁴⁴ The two categories of interest are Project Engineer and Program Engineer because the requirement to develop officers with the requisite skills necessary to fill these positions significantly increases at the field grade level.

The Project Engineer requires education, skills, and experience “beyond a generic [undergraduate] degree and PME [Professional Military Education].”⁴⁵ At a minimum, Project Engineers should have an engineering (or hard science) degree with some professional training/certification. Experience levels should include construction, junior USACE assignments,

⁴² Engineer Leader Technical Competency Employment Work Group, *Engineer Leader Technical Competency Employment Strategy*, (Study, Fort Leonard Wood: U.S. Army Engineer School, 2008), 4-5. The Employment Work Group developed these four categories by defining the technical requirements of current positions documented on current Modified Table of Organization and Equipment (MTOEs) and Table of Distribution and Allowances (TDAs). This was necessary for structuring a framework to develop a methodology to analyze the current required technical competencies of the Engineer Regiment.

⁴³ Ibid., 5. A Military Engineer does not require a technical undergraduate degree but must successfully complete Professional Military Education (PME) and developmental assignments that do not have technical requirements. A Military Engineer is tactically competent, understands general engineering, and knows how to plan and employ engineer units to provide assured mobility and limited engineering support to the maneuver commander.

⁴⁴ Ibid., 7. A Technical Engineer requires extensive depth of knowledge on a particular field of engineering that exceeds a generic degree and PME. A Technical Engineer has advanced degrees and experience in a focus field such as Geospatial, Prime Power, and USMA instructor.

⁴⁵ Ibid., 5.

or junior DPW assignments. The Project Engineer is expected to plan and execute complex general engineering tasks.⁴⁶

A Program Engineer is expected to possess “a competent engineering understanding from a combination of an advanced engineering degree and applicable engineering experiences.”⁴⁷ A Program Engineer should possess a graduate level engineering degree, professional licenses and certifications, and training with sister services or industry. Previous experience should include USACE project officer, military DPW positions, or Army Service Component Command (ASCC) staff engineers. A Program Engineer is expected to “have the skills and knowledge consistent with leading a large technical organization.”⁴⁸

The working group classified the requirements for AC field grade officers (Major through Colonel). The analysis for Project Engineers and Program Engineers shows at the rank of Major, 51% of assignments are Project Engineer related and 4% are Program Engineer Related. At the rank of Lieutenant Colonel, 44% of assignments are Project Engineer related and 21% are Program Engineer related. At the rank of Colonel, 50% of assignments are Project Engineer related with 32% being Program Engineer related.⁴⁹

This analysis shows that from the rank of Major through Colonel, the requirements for Program Engineer related skills grows from 4% of Major assignments to 32% of Colonel assignments. Raw numbers indicate that for Program Engineers, 20 positions are required for Majors, 57 are required for Lieutenant Colonels, and 33 are required for Colonels. To meet this growth, the current education, skills, and development required for Program Engineers must grow as well.

⁴⁶ Ibid., 6.

⁴⁷ Ibid.

⁴⁸ Ibid.

⁴⁹ Ibid., 7.

Current Engineer Field Grade Officer Education, Training, and Development

The education, training, and development of field grade Engineer officers are currently insufficient to close the technical competency gap created by the change in doctrine. Colonel Roger A. Wilson Jr., in his U.S. Army War College (USAWC) Strategy Research Project, describes the U.S. Army's Training and Doctrine Command's (TRADOC) three leader development domains that the Army uses in its leader development model.⁵⁰ The domains are Institutional Training, Operational Assignments, and Self Development. He further shows how the Army's leader development initiatives will compete with the Engineer Regiment's initiative to develop leaders with technical abilities to meet the doctrinal requirements of stability operations.

In the Institutional domain, the only fully funded educational opportunity available to engineer senior Captains and Majors is the Army's Advanced Civil Studies (ACS) program. Prior to the Army's Expanded Graduate Studies Program (EGSP), an Army retention and leader development initiative, the Engineer Branch received a disproportionate amount of ACS slots. EGSP significantly increases the number of ACS slots; however, it also increases the competitiveness for funding and selection. Furthermore, EGSP slots are not technically oriented programs whereas Engineer Branch's ACS positions focus on USACE specific education requirements. Instead of addressing the competency gap in stability operations, EGSP and the small number of Engineer ACS slots may exasperate that gap. Colonel Wilson points out that "less than one-half of one percent of the total opportunity officially dedicated to engineering (12 of 2,514 graduate school opportunities), the educational and leader development gap the EGSP was meant to address may only get minimally filled."⁵¹

In the Operational Assignments domain, Colonel Wilson identifies numerous issues facing the Engineer Branch. The primary issue facing the Regiment is the lack of technical

⁵⁰ Wilson, *Campaign Quality Gap: Developing Strategic Engineering Competency*, 17.

⁵¹ *Ibid.*, 13.

development assignments available to field grade engineer officers. Currently, there is only one Army organization that offers engineer officers this opportunity, it is USACE. The Army's force transformation to the modular brigade and funding, however, prevents the Engineer Regiment from filling its USACE assignments to capacity and expanding its available assignments (both within and beyond USACE).⁵²

Modularity forced the engineer branch to reduce its force structure and eliminate the majority of its headquarters at battalion and brigade-level. This reduction therefore places a strain on the assignments process which limits the number of officers available for assignment to USACE. Additionally, modularity forced the conversion of military directors of public works (DPW) on military installations to civilian directors. The Army, in an effort to increase the number of BCTs, identified DPW positions as nonessential.⁵³ In eliminating these positions, the Army eliminated developmental positions that gave engineers critical experience in facility engineering and management.

The education, training, and development of field grade engineer officers is insufficient to develop the technical skills for stability operations. The ACS program is, at present, not large enough to meet the educational requirements of the Regiment. Additionally, the technical assignments that utilize these advanced degrees are not available in sufficient numbers or areas of expertise. To remedy this, the Army must change the allocation of ACS slots, return DPW assignments to uniformed personnel, and look for additional opportunities to develop technical skills for stability operations.⁵⁴

Emerging Gaps between Doctrine and Engineer Officer Capabilities

As identified earlier, two tasks specified in FM 3-07 have engineer specific subtasks. A closer look at what those two tasks are, as well as a review of studies and after action reports will

⁵² Ibid., 14.

⁵³ Ibid., 9.

⁵⁴ Ibid., 19.

show that the Army (in general) and specifically engineers are lacking the appropriate competencies to fulfill their doctrinal role adequately. Two studies highlight these lack of skills. The first is an analysis conducted by the TRADOC Analysis Center (TRAC) titled, *Stability Operations Capability Gap Prioritization*. The second is a report conducted by the Center for Army Lessons Learned (CALL) focusing on engineer operations during Operation Iraqi Freedom titled, *Engineer Operations Operation Iraqi Freedom August-September 2008 Initial Impressions Report*.

The TRAC report is a strategic and theater level analysis of capability gaps in stability operations. The report defines capability gaps as a mission or task that the Army does not have the units, personnel, equipment or training to accomplish.⁵⁵ It builds upon previous studies of U.S. Army capabilities and the S/CRS Reconstruction Essential Task List that identified gaps in capabilities versus required tasks to succeed. Based off of these capability gaps, TRAC prioritized eighteen capability gaps. These tasks are categorized as tier 1 or 2. Tier 1 tasks are Army specific tasks; in other words the Army must have the ability to perform the task. Tier 2 tasks are interagency tasks but critical for success. Therefore, the Army must retain the capability to perform the task until the interagency is able to assume responsibility.⁵⁶ Tier 1 and 2 tasks are the equivalent of the first two categories of stability operation tasks in FM 3-07.

The CALL study is the result of an engineer-specific Collection and Analysis Team (CAAT) that focused on engineer operations during Operation Iraqi Freedom and was conducted in August/September 2008. It focuses on five areas concerning engineer support to stability operations. They are: Engineer command and control, Engineer leader skills, contingency base camps, Engineer support operations, and route clearance operations.⁵⁷ It specifically addresses the technical skills of Engineer officers, including the capacity building capability of Engineers.

⁵⁵ Matt Koehler, Major, William Krondak, and Jay Persons, Major, *Stability Operations Capability Gap Prioritization*, (Technical Report, Fort Leavenworth: TRADOC Analysis Center, 2008), 1.

⁵⁶ Ibid.

⁵⁷ CALL, *Engineer Operations Operation Iraqi Freedom August-September 2008*, 3.

The findings of the report include: the stability operations tasks *Restore Essential Services* and *Support to Economic and Infrastructure Development* are directly supported by engineers, that engineer leaders require more training and experience in the technical aspects of stability operations, and capacity building requires technical experience. The CALL study findings substantiate some of the initiatives of the BGE campaign.

The task *Restore Essential Services* has one subtask that is heavily dependent on Engineers, the subtask of *Provide Essential Services*. Initially, this subtask requires providing basic humanitarian needs of food, water, shelter, and medical needs to the people.⁵⁸ The Army is arguably capable of handling these tasks. However, beyond the initial requirements of humanitarian needs are the efforts to restore the necessary essential services of a society. FM 3-07 uses the acronym SWEAT-MSO⁵⁹ to identify the services. They are sewer, water, electricity, academics, trash, medical, safety, and other considerations. Engineers are usually heavily involved in the first three and have a role in the remaining five.

The TRAC report confirms this capability gap by identifying two of the aforementioned services as gaps and categorizes them as tier 1. They are electricity and wastewater. They are prioritized as #11 and #13, respectively, and are also considered initial response tasks. The report concludes that the “Army has no operational or institutional engineer units or personnel with the capability to build, repair or operate 4.5 megawatt (MW) and higher power plants (major population centers over 100,000 population) or high tension power distribution systems.”⁶⁰ Likewise for wastewater management, the report recognizes the “Army has no operational or institutional engineer units or personnel with the capability or training to build, repair or operate waste treatment facilities.”⁶¹

⁵⁸ Army, *FM 3-07, Stability Operations*, 3-9.

⁵⁹ *Ibid.*

⁶⁰ Koehler, Krondak, and Persons, *Stability Operations Capability Gap Prioritization*, A-1.

⁶¹ *Ibid.*

The CALL study echoes the TRAC report and calls for the identification of specific engineer technical skills required for stability operations.⁶² With regards to SWEAT-MSO, the report cited areas of more emphasis include “training on civilian electrical, water and sewage treatment systems.”⁶³ It goes on to identify the lack of developmental assignments available to engineer officers to develop the skills and experience in these technical fields.⁶⁴ Additionally, the CALL study states “assignments with the U.S. Army Corps of Engineers as well as interagency and training with industry are alternatives that should be considered to develop the skills and experience.”⁶⁵

The task *Support to Economic Infrastructure* has two engineer related subtasks, *Restore Transportation Infrastructure* and *Support General Infrastructure Reconstruction Programs*. The objective of this task is to establish the foundation to build the capacity for a host nation’s economy to develop. While civilian agencies or organizations have the resident expertise to accomplish this task, the military recognizes it may be called upon to initiate the programs that will set the foundation for future success. It is incumbent for military forces to have an understanding of how to start the process so they can hand it off to the civilian agencies without causing those agencies to start over after the transition.

Restore Transportation Infrastructure may require military forces to conduct infrastructure assessments of the host nation’s national transportation system. The system includes airports, roads, bridges, railways, and coastal and inland ports, harbors, and waterways. The subtask may also require military forces to determine and prioritize infrastructure programs and projects as well as perform expedient repairs of facilities.⁶⁶

⁶² CALL, *Engineer Operations Operation Iraqi Freedom August-September 2008*, 24.

⁶³ Ibid., 25.

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Army, *FM 3-07, Stability Operations*, 3-18.

The TRAC report identified railway construction and port dredging as gaps in the Army's capability to accomplish the restoration of transportation infrastructure. Both are considered initial response and tier 2 tasks. They are prioritized #16 and #17, respectively. The report's conclusion, in regards to railway construction, is that the "Army has no organization capable of building or conducting large scale repairs to railroads."⁶⁷ The report has a similar conclusion concerning dredging operations, "The Army has no organization capable of conducting large scale dredging operations to reestablish major port operations."⁶⁸ Although the resident knowledge may exist in USACE's DoD civilian work force, the Army does not have personnel and equipment to accomplish this task.

The CALL report reinforces the TRAC report's conclusions by identifying the general need to improve the capacity development capabilities of the Engineer Regiment for host nation infrastructure.⁶⁹ The report also specifically identifies the need to train engineers on the construction and classification of Lines of Communication (LOC) bridging (semi-permanent) and civilian/commercial bridges (permanent).⁷⁰ While Army engineers have a good understanding of tactical bridging,⁷¹ they lack the equivalent knowledge of LOC and civilian/commercial bridging.

Support to General Infrastructure Reconstruction Programs specifically identifies the requirement of Engineers. As with the restoration of essential services, it identifies the importance of a thorough understanding of the civil component.⁷² The list of possible tasks includes:

⁶⁷ Koehler, Krondak, and Persons, *Stability Operations Capability Gap Prioritization*, A-2.

⁶⁸ Ibid.

⁶⁹ CALL, *Engineer Operations Operation Iraqi Freedom August-September 2008*, 25.

⁷⁰ Ibid.

⁷¹ U.S. Department of the Army, *FM 5-34.343, Military Nonstandard Fixed Bridging*, (Washington D.C.: G.P.O., 2002), 1-2. Tactical bridges are generally used in an assault and provide a rapid means of crossing gaps. They are designed for temporary use and to support existing permanent bridges. Examples of standard tactical bridges are Armored Vehicle Launched Bridges (AVLB), Medium Girder Bridges (MGB), and Ribbon Bridges.

⁷² Army, *FM 3-07, Stability Operations*, 3-18.

- Assess overall condition of national energy infrastructure.
- Determine and prioritize essential infrastructure programs and projects.
- Assess conditions of existing power generation and distribution facilities.
- Assess conditions of existing natural resources conversion and distribution facilities.
- Assess conditions of existing facilities integral to effectively execute essential tasks in other sectors.
- Assess conditions of existing local, municipal facilities that provide essential services.
- Conduct expedient repairs or build new facilities to support local populace (i.e. schools, medical clinics, and municipal buildings).⁷³

This subtask links the essential services tasks with the infrastructure tasks, including the transportation piece. It highlights the need to competently assess energy infrastructure, natural resource (including oil) infrastructure, facilities, and municipal essential services facilities.

The TRAC study shows there are capability gaps in this task as well. Including the gaps identified in the electrical and wastewater sectors, the report also identifies a gap in the ability to “repair or manage oil facilities (refineries, etc.) or to conduct large scale repairs to oil pipelines.”⁷⁴ The report categorized this task as tier 2, initial response and prioritized it as #9 on its Risk Assessment Analysis.⁷⁵

The CALL study shows the Engineer Regiment is lacking in the competency to accomplish the range of missions associated with this task. The lack of knowledge of electrical power generation and distribution systems impacts the ability to assess the energy infrastructure of a nation. The lack of skills and subsequent requirements for improved training on civilian electrical, water, and sewage treatment systems negatively impacts the ability to assess local and municipal facilities. The inability to develop the capacity of host nation infrastructure could negatively impact the ability to determine and prioritize essential service programs or projects.⁷⁶

Two themes that consistently come out of doctrine are the requirement for contracting experience and the possible requirement of managing new construction projects. Both are

⁷³ Ibid.

⁷⁴ Koehler, Krondak, and Persons, *Stability Operations Capability Gap Prioritization*, A-2.

⁷⁵ Ibid., 7.

⁷⁶ CALL, *Engineer Operations Operation Iraqi Freedom August-September 2008*, 25.

essential to stability operations. While contracting is not an engineer specific task, it is important to have competent knowledge of construction to enable the management of construction contracts. It is also important to have competent Statements of Work (SOW) to write contracts. This requires knowledge of the field, i.e. construction, electricity, wastewater management, and knowledge of contracting.

Both the TRAC report and the CALL study identify contracting as an area for improvement. The TRAC report categorizes this as a tier 2 task and prioritizes it as # 8. Although, it does not directly connect contracting with infrastructure or essential services, it does link contracting with the missions that affect stability operations.⁷⁷ The CALL study does specifically identify the need for engineers to have a better understanding of contracting procedures. It also identifies further emphasis on developing and writing SOWs that will strengthen contracts. The study claims “contracting officers are not qualified technically, to write engineer related SOWs.”⁷⁸ The study also indicates the need to improve the project management abilities of Engineer officers.

A closer look at the engineer specific stability operation tasks reveals a doctrinal requirement to be proficient in numerous technical tasks. The findings of two recent studies indicate the need for further training in many of those same tasks. Both studies also indicate that the Army does not have the ability to develop the capabilities in a timely manner. To recruit officers with the technical skills and the experiences necessary to be field grade officers takes considerable time. Likewise, to generate units with the unique capabilities and skills required to fill the gaps identified would take time.

⁷⁷ Ibid., B-10.

⁷⁸ Ibid., 24.

INDUSTRY

Peace and Stability Operations Industries

The Peace and Stability Operations industry is a growing field. A 2007 study conducted by Peace Operations Institute⁷⁹ shows industries and their gross revenues are steadily increasing. While the study is suspect, only 23 of 334 companies responded, it does reveal some interesting statistics and trends concerning the industries involved with stability operations. Forty-seven percent of the companies are headquartered in the United States and the number of companies formed has steadily increased since 1991. The average gross revenues, since 2002, increased by 86% (the 2006 average gross revenue was \$256 million). Finally, 83% of the companies offer Logistics and Operational Support Services, of which engineering (constructing infrastructure) is considered.⁸⁰

The statistics of the survey are not scientific and are inconclusive; however, the trends show that the field is growing, the revenue is increasing, and infrastructure related engineering is an area of expertise. One can conclude that private sector industry in the fields required for stability operations is increasing. This increases the competition for technically competent civilians for stability operation jobs. Additionally, these contractors work on a strictly volunteer basis which could further increase the reliance on the military to shoulder a larger portion of the stability operations tasks, for a longer time.

⁷⁹ J.J. Messner, and Ylana Gracielli, *State of the Peace and Stability Operations Industry Survey 2007*, (Survey, Washington D.C.: Peace Operations Institute, 2007), 13. The Peace Operations Institute (PSOI) was created in 2007 with assistance from the International Peace Operations Association (IPOA) to better understand the role of the private sector in stability operations. This survey is considered non randomized, thus the reliability and transmissibility is questioned. The overall response rate was 13.6% and the preponderance of those were members of the International Peace Operations Association, thus they had incentive to participate. However the study does attempt to cover the entire industry, not just the security realm.

⁸⁰ *Ibid.*, 10. Logistics and Operational Support Services includes tactical equipment operation and maintenance (mobile repair service, inventory management); engineering (constructing infrastructure); medical services; strategic participation in humanitarian action; counter-intelligence measures (surveillance, intelligence gather, IT and communications security); assistance in demobilizing/reforming combatant groups.

Importance of the Private Sector in Stability Operations

Stability operations require both the concentrated and concerted efforts of numerous organizations. FM 3-07 identifies the following as potential actors in stability operations: the host nation, intergovernmental organizations, international/regional organizations, other government agencies, military forces, non government organizations (NGOs), and private sector entities.⁸¹ The numbers of actors will likely increase as the security situation improves and the theater matures. However, as indicated earlier, the military must prepare to conduct unilateral operations until conditions exist for civilian personnel to enter theater.

Private industry plays a vital role in stability operations. A 2005 report by the Defense Science Board (DSB) Task Force⁸² described the private sector as “the fifth force provider for stability operations along with the other four services.”⁸³ The DSB describes the private sector as “companies, non-profits, FFRDCs [Federally Funded Research and Development Centers], university departments, and individual consultants.”⁸⁴ Furthermore, the report shows that essential skills such as reconstruction and operation of urban infrastructure are lacking in the DoD.⁸⁵

A 2006 study⁸⁶ conducted by the RAND National Defense Research Institute, noted that the private sector may have limited expertise in specialized stability operation tasks, however the

⁸¹ Army, *FM 3-07, Stability Operations*, A-13.

⁸² Defense Science Board (DSB), *Institutionalizing Stability Operations within DoD*, (Review, Washington D.C.: Office of the Under Secretary of Defense For Acquisition, Technology, and Logistics, 2005), Appendix A. The DSB Task Force was created in response to a request from the Deputy Secretary of Defense and was tasked to investigate the “organizational structures necessary to support or conduct stability operations.”

⁸³ *Ibid.*, 31.

⁸⁴ *Ibid.*

⁸⁵ *Ibid.*

⁸⁶ Nora Bensahel, Charles Nemfakos, Bernard Rostker, and Kimberly Curry, "Effective Engagement of the Private Sector in Stability Operations," *Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics*, August 2006, <http://www.acq.osd.mil/dpap/contingency/reports/Rand/RAND-FinalDraft-200608.pdf> (accessed January 15, 2009), Appendix A, Deputy Secretary’s memo. The study was sponsored by the Undersecretary of Defense (Acquisition, Technology, and Logistics)[USD (AT&L)] to “[d]esign a new institution to exploit effectively our “Fifth Force Provider”, the private sector.”

majority of their efforts will focus on restoring host nation infrastructure including: water, power, and other essential services.⁸⁷ Additionally, it notes that infrastructure improvement tasks may seem like high priority tasks, in reality these large scale projects that produce high employment yield little short term benefits in relation to their costs.⁸⁸

While these large scale projects may not be a high priority, they will need to occur at some point. When they do, the private sector will be involved in the construction, operation, and capacity building of them. As the S/CRS Post-Conflict Reconstruction Essential Task list and FM 3-07 indicate, there are numerous smaller tasks that must take place before these large scale projects can occur. Two examples of these smaller tasks are the *restoration of essential services* as well as the *infrastructure assessment and project planning list*, all of which should be done prior to private sector involvement and, as described earlier, may fall on the shoulders of the military.

Role of Private Sector in Stability Operations

The private sector contributes to stability operations, specifically essential services and infrastructure in various ways. Two such ways are large scale developers of national infrastructure projects and individual consultants, with technical expertise in essential services fields. In the case of the Iraq War in 2003, the consultants may arrive early in the operation as part of an administrative organization, such as the Office of Reconstruction and Humanitarian Assistance (ORHA) in Iraq.⁸⁹ The large-scale contractors will follow when the environment is

⁸⁷ Ibid., 14.

⁸⁸ Ibid., 13.

⁸⁹ Steven R. Miles, Lieutenant Colonel, "Reconstruction Under Adversity Rebuilding Iraq-Lessons for the Future," Defense Technical Information Center (DTIC) Web site, March 15, 2007, <http://stinet.dtic.mil/cgi-bin/GetTRDoc?AD=ADA469612&Location=U2&doc=GetTRDoc.pdf> (accessed February 21, 2009), 4-5.

more permissive. For instance, in Iraq “major U.S. private contractors were given responsibility for electricity and most other services.”⁹⁰

Infrastructure developers will conduct large scale reconstruction projects that stabilize a country. While these projects will most likely occur well after the transition of authority (military to civilian to possibly host nation), the military will still play a role in their development. The military role will include conducting necessary assessments, SOWs, and even managing contracts that lay the foundation for the larger infrastructure development projects.

The RAND Study *Stabilization and Reconstruction Staffing: Developing U.S. Civilian Personnel Capabilities*, describes the traits of a competent SSTR civilian staff as: provide continuity, employed in their profession, employed within their abilities, appropriate number of cultural experts, and have the required “psychological fitness” for that environment.⁹¹ Of the five traits, two (possibly three) are inherent in the military profession. The remaining traits are attainable.

The study also looked at the civilian capacity to field a SSTR staff and they used the Coalition Provisional Authority (CPA) staff in Iraq from 2003-2004. The staff was comprised of approximately 28% military personnel, 13% coalition personnel, 26% U.S. government civilians (including DoD); and 25% contractors and temporary employees.⁹² While the study concludes one of the major reasons for the lack of civilian government employees was due to inadequate government personnel systems, it does show the importance of contractors to stability

⁹⁰ Robert C. Orr, *Winning the Peace: An American Strategy for Post-Conflict Reconstruction*, (Washington D.C.: Center for Strategic and International Studies Press, 2004), 277.

⁹¹ Terrence K. Kelly, Ellen E. Tunstall, Thomas S. Szayna, and Deanna Weber Prine, *Stabilization and Reconstruction Staffing: Developing U.S. Civilian Personnel Capabilities*, (Research, Santa Monica: RAND Corporation, 2008), 12. The five traits of a competent staff: 1) Provide Continuity (i.e. in country for at least one year); 2) Work in their areas of professional and technical expertise; 3) Work at a level not grossly beyond their previous experiences; 4) Include an appropriate number of experts on the part of the world in which the operation is to take place; 5) Have the temperament and ability to work in the location that is austere and, at times, dangerous.

⁹² *Ibid.*, 16.

operations.⁹³ Likewise, it shows the level of involvement of military personnel in support of civilian led SSTR operations.

The private sector has an enormous role in stability operations, predominantly essential services and infrastructure repair/development. The role of the private consultant has grown significantly over the years and will remain so in the future. Even with their involvement it is necessary for the military 1) to augment the civilian staff and competently work alongside them and 2) be prepared to fill their role if necessary. When contractors are not available, the military must have the knowledge and expertise to accomplish the mission; if they cannot then they must develop that capability.⁹⁴

Role of Private Sector in Training Essential Services

The private sector can also play an important role in developing the education, training, and experience of Army Engineer officers for two reasons. First, the companies involved in stability operations overseas are working on infrastructure development projects that deliver essential services. Secondly, private industry is playing the same role in providing infrastructure development and essential services in the United States.

Public Private-Partnerships (PPPs) are private sector companies that develop infrastructure projects or provide essential services to a portion of the American public. The U.S. General Accounting Office (GAO) defines PPPs or public-private venture as contractual arrangements “between public and private-sector partners. These arrangements typically involve a government agency contracting with a private partner to renovate, construct, operation, maintain, and/or manage a facility or system, in whole or in part, that provides a public

⁹³ Ibid.

⁹⁴ Joseph R. Cerami and Jay W. Boggs, eds., *The Interagency and Counterinsurgency Warfare: Stability, Security, Transition, and Reconstruction Roles*, (Carlisle: Strategic Studies Institute (SSI), 2007), 494.

service.”⁹⁵ While there are various types of PPPs, they all have the same purpose of leveraging private industry to provide a service or function for the American public.

PPP infrastructure projects in the United States involve road, rail, airport, seaport, water, and building projects. Since 1985, PPPs planned or completed \$104.2 billion of infrastructure development projects.⁹⁶ These projects are all areas of interest concerning stability operations. Furthermore, in 2002 the National Council for Public-Private Partnerships (NCPMP) reported “the average American city contracts out 23 of its 65 basic municipal services to the private sector, and states contract out approximately 14 percent of their activities.”⁹⁷

The private sector is currently involved in providing infrastructure development and essential services in the United States through PPPs. These projects and services are the same activities that the private sector contributes during stability operations. They are also, by and large, the same types of projects and services the Army has identified as required capabilities and, in some cases, recognized gaps for stability operations. It makes perfect sense for the Army to partner with the private sector to train its Engineer officers in the doctrinally required stability operations tasks.

⁹⁵ U.S. General Accounting Office, *Public Private Partnerships: Terms Related to Building and Facility Partnerships*, (Informational, Washington D.C.: United States General Accounting Office, 1999), 13.

⁹⁶ AECOM Consult, Inc., "Synthesis of Public-Private Partnership Projects for Roads, Bridges & Tunnels from Around the World-1985-2004," *National Council for Public-Private Partnerships (NCPMP)*, August 30, 2005, <http://ncppp.org/councilinstitutes/fhwapppp.pdf> (accessed February 13, 2009), 9.

⁹⁷ National Council for Public-Private Partnerships (NCPMP), "For the Good of the People: Using Public-Private Partnerships To Meet America's Essential Needs" *National Council for Public-Private Partnerships (NCPMP) White Pages*, 2002, <http://www.ncppp.org/presskit/ncpppwhitepaper.pdf> (accessed February 13, 2009), 8.

TRAINING WITH INDUSTRY PROGRAM (TWI)

What is TWI and Why Does it Exist?

Training with Industry (TWI) is a program that assigns officers to civilian industries to “observe and learn the technical and managerial aspects of that field.”⁹⁸ TWI is designed to give those military officers upper level managerial experience in fields that are not available in the military. According to Army Regulation (AR) 621-1, *Training of Military Personnel at Civilian Institutions*, the TWI program exists “to provide training and/or development of skills in U.S. private sector procedures and practices not available through existing military or advanced civilian schooling programs or other established training and education programs.”⁹⁹ The TWI program is outlined in AR 621-1 and in Department of the Army Pamphlet (DA PAM) 600-3, *Commissioned Officer Professional Development and Career Management*, in the specific branch and functional area (FA) chapters.¹⁰⁰

The Army’s goal for the program is to develop a group of Soldiers with the experience and understanding of their industry and how it relates to specific functions of the Army. This group can use this knowledge to better inform and improve the Army as it deals with their respective industries.¹⁰¹

The current regulation, AR 621-1, identifies five criteria for a TWI assignment:

- There must be an explicit DOD requirement fulfilled by virtue of experience gained.
- There must be immediate follow on utilization tour/assignment available to which the individual will be assigned.
- The TWI tour/assignment must be a minimum of 6 months and a maximum of 12 months in duration.

⁹⁸ U.S. Department of the Army, "Department of the Army Pamphlet 600-3," *Commissioned Officer Professional Development and Career Management*, (Washington D.C.: Department of the Army, December 11, 2007), 16.

⁹⁹ U.S. Department of the Army, "Army Regulation 621-1," *Training of Military Personnel at Civilian Institutions*, (Washington, D.C. : Department of the Army, August 28, 2007), 17.

¹⁰⁰ Army, "DA PAM 600-3," *Commissioned Officer Professional Development and Career Management*, 16.

¹⁰¹ U.S. Army Human Resources Command, "Training With Industry (TWI) Student Handbook, Officer Personnel Management Directorate," (Alexandria: U.S. Army Human Resources Command, 2006), 1.

- The proposed TWI tour and/or assignment must meet professional development requirements.
- There must be a written agreement between the private sector host and the DOD Component concerned prior to the start of the TWI assignment.¹⁰²

The regulation places restrictions on the types of industries allowed to participate in the program.

One such restriction is that only private, U.S. commercial industries may participate in the program. Another minor restriction is the U.S. Army Human Resource Command (HRC) will not provide any funding for the TWI program. However, because the officer is detailed to the industry, “the Department of Defense continues to pay normal pay and allowances to the individual while assigned outside the Department.”¹⁰³ This enables the program to be executed with minimal cost.

The quota of TWI assignments varies between 50 and 70 positions annually due to budget, policy, and requirements.¹⁰⁴ This quota, and the list of participating industries, are approved by the Principal Deputy Under Secretary of Defense for Personnel and Readiness.¹⁰⁵

The same office approves any changes to the list of approved industries. All requests are submitted through HRC. The usual TWI assignment is 10 months, with a 24-month post schooling assignment that is determined by the career branch of the student. The regulation does not identify this assignment as a utilization tour but it does give HRC approval authority of all post school assignments.

TWI Utilization by Component and Branch

AR 621-1 sets the criteria for TWI assignments, DA PAM 600-3 provides the description of Army basic branches and functional areas that may participate in the TWI program. A review of the pamphlet reveals that not all branches in the TWI program have a specified requirement to

¹⁰² Army, "AR 621-1," *Training of Military Personnel at Civilian Institutions*, 16-17.

¹⁰³ U.S. Department of Defense, "DoD Instruction Number 1322.06." *DoD Issuances*, November 15, 2007, <http://www.dtic.mil/whs/directives/corres/pdf/132206p.pdf> (accessed February 17, 2009), 7.

¹⁰⁴ Army, "DA PAM 600-3," *Commissioned Officer Professional Development and Career Management*, 16.

¹⁰⁵ Army, "Army Regulation 621-1," *Training of Military Personnel at Civilian Institutions*, 18.

participate in the program. Furthermore, it shows that the Engineer Branch does have the necessary skill requirements to warrant participation in TWI.

Based on DA PAM 600-3, there are four branches and 10 functional areas that participate in the TWI program. It also identifies the following concentrations for the TWI programs: transportation, procurement, logistics management, research and development, public affairs, banking, communication-electronics, advertising and marketing, physical security, artificial intelligence, and automation systems.¹⁰⁶

Currently, there are 55 commissioned officers participating in the TWI program, working at over 40 different companies.¹⁰⁷ Of those 55 officers, 10 of the positions are allocated to the Surgeon General's office. Since the Surgeon General's office manages the careers of the Army Medical Department (AMEDD), not HRC, those 10 positions are removed from this analysis. The remaining 45 positions are HRC controlled basic branches and functional areas.

The allocation of TWI positions by HRC shows 20 are reserved for six (out of 10) functional areas [Public Affairs (FA 46), Telecommunications Systems Engineering (FA 24), Information Systems Management (FA 53), Space Operations (FA 40), Nuclear and Counterproliferation (FA 52), and Army Acquisition Corps (FA 51)]. The remaining 24 positions are distributed to basic branches. Of the four basic branches identified by DA PAM 600-3, only three are utilizing TWI positions (Signal, Logistics, and Finance). The Logistics Corps is comprised of officers from three branches, Transportation, Ordnance, and Quartermaster. Although the training positions are allocated by branch [Logistics (90), Transportation (88) and Quartermaster (92)] they will all count towards the Logistics branch. Those branches comprise of 17 of the 24 basic branch positions available. The remaining seven positions are filled by five basic branches that are not identified in DA PAM 600-3 for the opportunity to pursue TWI for

¹⁰⁶ Army, "DA PAM 600-3," *Commissioned Officer Professional Development and Career Management*, 28.

¹⁰⁷ U.S. Army Human Resources Command, "FY2009 Training With Industry (TWI)," Allocation Tracker, (Alexandria, 2009), 1-4. Sent to author via email to analyze TWI allocations and utilizations.

required officer characteristics or for officer development and assignments. They are the Adjutant General Corps, the Chemical Corps, Civil Affairs, Psychological Operations, and the Military Police Corps. Reviewing the characteristics of these four branches, only Military Police specifies “there are branch-unique skills, knowledge, and attributes that require professional development.”¹⁰⁸

There are only two other branches that have the same characteristic as the Military Police branch. One is the Acquisition Corps (FA 51) which explicitly states the opportunity for TWI; the other is the Engineer branch. This analysis concludes, based upon the information in AR 621-1 and DA PAM 600-3, the Engineer Branch meets the pre-requisites to compete for TWI positions. The required change is in the TWI program focus areas.

TWI as a Method to Close a Portion of the Gap

Infrastructure development and essential services, while largely a function of government, are increasingly managed by the private sector. This is due to the cost of administering the project or service and the technical expertise found in the private sector.¹⁰⁹

Infrastructure development and essential services are two focus areas for the Engineer Regiment during stability operations. They are also areas that are identified as gaps in technical capabilities in the Regiment. It only makes sense to try to close some of this gap by working with the industries that deliver these projects and services on a regular basis.

TWI is an existing program the Engineer Regiment can leverage immediately. It offers Engineer officers the opportunity to develop skills and experiences beyond the traditional USACE assignments. It also fills the void created by the transition of DPW jobs from military to civilian. Additionally, TWI allows the Regiment to address select concerns identified in the BGE campaign.

¹⁰⁸ Ibid., 146.

¹⁰⁹ NCPPP, “For the Good of the People: Using Public-Private Partnerships To Meet America's Essential Needs,” 8.

TWI supports the BGE campaign as an initiative that cuts across all six working groups. TWI directly supports the Employment, Futures, and Training and Education working groups by providing the technical skills and experiences required to develop project and program engineers. It supports the Futures work group with a method of developing low density skills and capacity development; additionally it provides a technical position to utilize those skills. Finally, TWI provides the Training and Education work group with an existing program that can be quickly incorporated into developing technical skills of field grade officers.

TWI also indirectly supports the remaining three BGE working groups by providing incentives for Accessions and Retention work groups. The Engineer Regiment identified the need to recruit more technically-educated officers. Having a program available for engineers to utilize their degrees should assist recruiting, especially if the opportunity goes beyond the traditional construction project management assignments. This same incentive could be an important retention tool for officers with technical degrees to remain in the Engineer Regiment and the Army. Lastly, the TWI initiative could become a useful marketing tool for the Strategic Communications group to exploit for recruiting and retention.

The capability gaps identified by the analysis of doctrine and by the BGE campaign involve infrastructure development and the delivery of essential services. Both are industries that heavily involve the private sector, during both stability operations and the day to day operations of American society. Partnering with the private sector to develop the skills and experiences from the many PPPs that sustain the infrastructure and essential services of America will directly benefit stability operations. This partnership will build the capacity in the Engineer Regiment to work with the private sector companies that are required to succeed in stability operations.

Stability operations require the private sector to administer and develop the large scale infrastructure projects necessary for a society to function. Engineer officers already work alongside these industries and technical experts during stability operations. TWI offers an engineer officer the opportunity to learn firsthand what these industries and experts are expected

to bring to the operation. This knowledge will help the Army manage stability operations and facilitate a smooth transition to civilian control.

CONCLUSION

TWI is a viable approach to closing a select portion of the technical capability gap that exists in stability operations. The program is well suited to address some of the identified capability gaps in the Army and its Engineer Regiment. It addresses some of the technical competency concerns of the BGE campaign and provides at least one approach for each initiative. TWI will partner the Engineer Regiment with private industry, a major actor in stability operations and experts in essential services.

TWI is a program that currently exists and the Engineer regiment can leverage to address select concerns immediately. The TWI program is designed to give officers “the technical and managerial aspects of that field.”¹¹⁰ The technical competency gaps identified show that the Army does not currently have the capability to train engineer officers in select tasks required for stability operations. Financially, the cost is relatively low. The officer is detailed to the industry so normal pay and allowances exist. While the Regiment loses the officer for six to twelve months, it can immediately use that officer in a utilization tour afterwards. Additionally, if the Regiment is able to closely monitor the assignments of these officers, it can leverage those skills and experiences in future stability operations.

TWI is recognized by various studies and reports as a program that can assist the Engineer Regiment in closing the competency gap. TWI is specifically mentioned in the BGE Employment working group as a possible method to develop Program Engineers.¹¹¹ Additionally, it is specifically mentioned in the CALL report on engineer operations in Iraq.¹¹²

¹¹⁰ Army, "DA PAM 600-3," Commissioned Officer Professional Development and Career Management, 16.

¹¹¹ Engineer Employment Work Group, Engineer Leader Technical Competency Employment Strategy, 6.

¹¹² CALL, *Engineer Operations Operation Iraqi Freedom August-September 2008*, 25.

The recognition of TWI as a method to address technical competency gaps in the stability operations further reinforces the viability of the program for the Engineer Regiment.

Industry should be receptive to partnering with the Engineer Regiment. As shown, the stability operations industry is growing. Partnering with the Engineer Regiment allows industries that operate in stability operations to develop relationships and refine their practices. As highlighted earlier, the private sector is deeply involved in stability operations whether it be managing large-scale infrastructure development projects or individual contractors to augment civil-military staffs. A solid relationship between industry and the Regiment allows for a better understanding of the military for the “fifth source provider”, private industry. Additionally, the better job the Army does in preparing the foundation for transition to civilian control, the easier and less costly it is for private industry to perform its role. Offering the Engineer Regiment the opportunity to learn what the industry requires for success facilitates the smooth transition.

Doctrine states the Army must be prepared to execute all stability operations tasks independently. It recognizes that there will be times when the security environment will not be permissive enough for civilian agencies to operate. Additionally, the military will generally facilitate the transition from major combat operations to stability operations. It is imperative the military engineers have the ability to set the foundation that allows this transition to occur smoothly.

S/CRS, the organization identified to lead stability operations, is not fully operational. In the meantime, it is incumbent upon the military to maintain the ability to either assume the leadership or provide the necessary resources to enable S/CRS to accomplish its mission. This necessity is recognized by both the Defense and State Departments.

Recommendations

First, the Engineer Regiment should incorporate the TWI program into the BGE campaign and take necessary steps to implement it immediately. The TWI program has positive

impacts that cut across the six working group areas. Leveraging an existing program offers the campaign an opportunity to quickly address a select portion of the technical competency gap.

Second, the Engineer Regiment should request a change or modification of the focus areas for TWI. The current concentration areas for TWI do not include any stability operations specific areas. Adding a concentration that incorporates stability operations, specifically infrastructure development and/or essential services will allow PPPs to participate in the program. Based upon the five criteria for a TWI assignment, the Engineer Regiment has a valid argument and incentive to modify the focus areas. This is a requirement to participate in the program and must be done immediately. The request is submitted through HRC to the Under Secretary of Defense for Personnel and Readiness.

Third, the Army should partner with PPPs that provide essential services to state, municipal, or local governments. The TWI program only works with private commercial industries, due to the restriction of industries allowed to participate in the program, so partnering directly with the states will not work. Although, this restriction could be modified, it would not allow the Regiment to make immediate use of the program. Additionally, because only approved industries can participate in the TWI program, the Engineer Regiment must submit a request for specific industries to be added. This request is submitted through HRC to the Under Secretary of Defense for Personnel and Readiness who approves the list of participating industries.

Fourth, the Army should assign TWI trained officers to utilization tours with USACE, joint, or interagency positions. The Army should also prioritize the USACE assignments with divisions or districts conducting stability operations, such as Gulf Region Division (GRD) or Afghanistan Engineer District (AED). USACE assignments could also include forward engineer

support teams (FEST).¹¹³ Interagency assignments should include S/CRS or the United States Agency for International Development (USAID), both of which are organizations that will utilize the skills TWI offers.

Fifth, the Army should change DA Pam 600-3 to include TWI as a possible requirement for Engineers. The current document broadly addresses the need for additional education or training for professional development, however it does not specifically address TWI. This change is not a requirement to participate in the program and therefore will not prevent the Regiment from immediately participating. Instead, it will reinforce the need for TWI in the future.

Finally, the Army should maintain awareness of the required civilian agency tasks during stability operations. Doctrine, at all levels (DoD to FMs), recognizes that the military may be called upon to perform all tasks identified by the S/CRS. FM 3-07 only focuses on two of the three levels of tasks. It avoids discussing civilian agency tasks.

Areas for Further Study

An area of further study to better develop the TWI program for stability operations is the stability operations industry. As indicated in this monograph, it is a growing field and is extremely important to the success of this type of operation. What is not clear is how many of them are U.S. private commercial industries. Partnering with these industries, in addition to PPPs for essential services, may enhance the effectiveness of the TWI program.

A second area of further study is the TWI program in conjunction with an ACS program. To better prepare officers to serve in the TWI program, it may be necessary to send them to ACS prior to the TWI program. The advance degree may either be required by the industry or may be

¹¹³ U.S. Department of Defense, *Joint Publication 3-34, Joint Engineer Operations*, B-A-7. Two types of forward engineer support teams (FESTs) provide support to primarily general engineering efforts through forward-deployed engineer elements that can communicate with TeleEngineering Kits (TEKs) and reachback to technical experts within USACE.

necessary to raise the officer's education to perform in the industry. The advance degree is also the preferred education level of a Program Engineer, identified by the BGE Employment working group.

A third area of further study is the ACS program. Pursuing ACS opportunities offering cooperative education (internships) may help close the gap. Identify institutions that offer degrees with internships in essential service specific fields or public administration (city planning) that an officer can complete in sufficient time to serve a utilization tour. If the cooperative education is a requirement to earn the degree, then the financial cost of the internship may be included in the tuition.

A fourth area requiring more research is the Short Course Training program. This program is funded at unit level and has temporal limits. The program appears to have a great deal of flexibility, and the unit could tailor the training to meet its mission. The program could serve the needs of tactical unit preparing to deploy or it could be centralized under USACE. Funding will be an issue in administering this program.

In summary, the U.S. Army Engineer Regiment is committed to addressing the technical competency gap that developed from, among other things, a change in doctrine. The BGE campaign is developing the path forward for the entire Regiment. In the meantime, it is necessary for the Regiment to identify those gaps so it can immediately address by leveraging existing Army programs. TWI is one of those programs the Regiment can leverage to assist in the development of its field grade officers in select stability operations tasks. TWI, in conjunction with existing programs and assignments, will help develop officers with the required skills to meet the needs of the Regiment and ultimately the Army.

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