

Prime-Power Considerations for Engineer Planners

By Captain Geoff Van Epps

Recent experiences in Iraq, Afghanistan, East Timor, and other global hot spots have shown that most theater or Joint Task Force-level engineer staffs are largely unfamiliar with the capabilities, limitations, and employment of prime-power assets. Because the 249th Engineer Battalion (Prime Power) is the only unit of its kind in the Army, staff planners simply lack exposure to the unit and training in the employment of its assets. Furthermore, the current doctrinal guidance in Field Manual (FM) 5-422, *Engineer Prime-Power Operations*, frequently comes up short in bridging the gap between theory and practice because the manual was written before prime power was reorganized into the 249th Engineer Battalion in 1994. (FM 5-422 is being revised and will be published as FM 3-34.483, *Engineer Prime-Power Operations*.)

The following four lessons have proven to be the most important and most repeated comments over the course of the past two years of operations.

“All Things Electrical”

Often, engineer planners pigeonhole prime-power soldiers into one or two specific missions rather than capitalizing on the full range of their capabilities. In fact,

the prime-power production specialist (military occupational specialty [MOS] 52E [21P as of October 2003]) is the most versatile and best educated of the “green-suit” electrical specialties in the Department of Defense. Having completed an academically rigorous 50-week course and several technically challenging missions each year since entering the field, each prime-power soldier is capable of expertly accomplishing virtually any electrical mission, including technical assessments and design of power systems; installation, operation, and maintenance of power plants and distribution systems; maintenance and repair of circuit breakers and protective relays; and quality assurance on electrical contractors.

Recent missions which have showcased the versatility of prime-power soldiers include—

- Civil reconstruction efforts in Iraq.
- Installation and operation of four power plants in the Afghanistan theater.
- Base camp planning and design in Iraq.
- Technical reconnaissance of dozens of potential bases in Turkey.
- Construction of an overhead electrical-distribution system at Baghran Airfield.



Power plant installed in Kyrgyzstan

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A prime-power soldier works in the snow to keep the power on.

- Electrical assessments in the Philippines.
- Maintenance of the backup power plant at Incirlik Air Base, Turkey.
- Acting as the contracting officer's technical representative on U.S. Army Corps of Engineers (USACE) power contracts.

Engineer planners who recognize the full spectrum of prime power's capabilities and use prime power accordingly will not only improve the quality of support that engineers can provide but will concurrently realize great time and cost savings.

Long Logistical Tail

In general, prime-power units lack the capability to self-sustain below the company level. Since the prime-power platoon is the basic building block in terms of capability (and the company headquarters' current deployment to Baghdad is its first for any operation since prime power was reorganized as a battalion in 1994), this means that most often, deployed prime-power units will need administrative, supply, maintenance, and other support.

The prime-power platoon will require help in ordering and receiving parts and supplies since it has neither an organic supply noncommissioned officer nor a parts clerk. Lacking any mechanics other than for its generators, the platoon requires assistance with wheeled-vehicle and engineer equipment maintenance. With no personnel section, it needs support in processing finance and administrative actions. Finally, a prime-power platoon will require engineer support for excavation or trenching for installation of a distribution system.

If the company headquarters were to deploy (for instance, if two or more platoons simultaneously deployed to the same

area), it would bring some of the support capability that the platoon lacks. However, prime power would still lack vehicle maintenance capability and the ability to provide its own dig support.

Although doctrine in this area is fuzzy at best, recent lessons learned have shown that an individual platoon is best tied in with a colocated engineer battalion (combat)(heavy) or a similarly organized construction task force. The company headquarters, being a theater asset, would report directly to the senior engineer unit, whether an engineer command, an engineer brigade (theater Army), or another engineer unit proportional in size to the theater headquarters. In cases where there is no local engineer headquarters of sufficient size, the best command-support relationship is to keep prime power attached to the nearest large engineer headquarters but make the platoon in general support of the local command. While the actual task organization will vary from mission to mission, the rule of thumb is to control prime-power assets at the highest level possible, since their capabilities will be required theaterwide and the soldiers will end up literally all over the battlefield conducting assessments, providing design expertise, offering technical assistance, and executing other missions.

Managing Expectations

Deploying prime power to support base camp development can be expensive, complex, and time-consuming, but it still offers the most responsive, efficient, and cost-effective means of providing reliable, utility-grade power to large military facilities during contingency operations. The timeline for procuring the bill of materials (BOM) required to construct an electrical-distribution system can be quite lengthy, since most industry has converted to



Two prime-power soldiers repair an Iraqi generator.

lean manufacturing techniques and small inventories, meaning that most materials are built to order. This can result in delivery schedules of 60 days or longer for materials. However, the procurement timeline for BOM can be significantly shortened by involving prime power in planning early, by anticipating mission requirements, and by using an “off-the-shelf” USACE IAP Worldwide Services Power Contract to streamline the contracting process.

As the 249th Engineer Battalion continues its force modernization process through fiscal year 2004, more platoons will be outfitted with the Deployable Power-Generation and Distribution System, which includes a great deal of “plug-and-play” materials that are compatible with Force Provider and the Air Force’s Harvest Eagle/Harvest Falcon bare-base packages. Also, a good portion of the BOM for a base camp electrical system can be found in the Prime-Power Connection Kit, which is available with many Force Provider sets.

The BOM required for most prime-power missions, especially for nonstandard base camp construction, can be expensive, often resulting in initial sticker shock for the customer. For example, the material procurement cost for the 10,000-soldier base camp at Balad Airfield in Iraq was less than \$10 million, but that cost will continue to grow (along with all other construction costs) as the standard of living in the theater improves. The high material cost is inherent in the significantly higher level of service and greater reliability afforded by prime-power over unit tactical generators. Engineer staff officers should anticipate the high cost and prepare the customer early to help mitigate sticker shock and manage expectations.


Another customer expectation that needs to be carefully managed is the time required to install a power plant and construct an electrical-distribution system. Once the power plant and associated equipment have been moved to their

desired location (often a Herculean effort in itself due to the size and weight of the equipment, special material-handling requirements, and other factors), setting up the plant and delivering electricity to the customer is not an overnight process. Often customers perceive that once the generators are on the ground, prime-power engineers simply and quickly runs a big extension cord to all of the facilities on a base camp. On the contrary, the process of installing a grounding grid, switchgear, miles of cable, and dozens of transformers is a time- and labor-intensive process that requires clear guidance from the customer and prioritization to ensure that the most critical loads are serviced first.

Early In, Early Out

With only eight power-generation platoons on active duty and two more in the Reserve Component (see article on page 55), the 249th Engineer Battalion

(Prime Power) is extremely small to be shouldering the U.S. Army’s entire prime-power mission. Executing multiple rotations to support combat operations while honoring standing commitments in Korea, Hawaii, and Europe has proven to be a delicate balancing act. In September 2002, the battalion’s soldiers were simultaneously engaging in missions in the combat zones of Operation Enduring Freedom, preparing for combat operations in Operation Iraqi Freedom, and conducting disaster relief in Guam, which stretched the unit’s members to the breaking point. Consequently, prime power has evolved into an early-entry, contingency solution for filling military power requirements, with each deploying platoon capable of installing and operating a power plant, constructing an electrical-distribution system, and providing technical assistance and planning to fill follow-on power needs.

Power during the first 30 to 90 days of an operation should be provided by unit tactical generators. Prime power provides a transition from 30 to 180 days into an operation and would ideally be relieved by either commercial or contract power. Sources for contracted follow-on power include the Logistics Civil Augmentation Program, Air Force Contract Augmentation Program, (Navy) Emergency Construction Capabilities Contract, and the USACE IAP Worldwide Services Power Contract. Whatever the source, planning for follow-on power should begin early—ideally as soon as the requirement for prime power is identified—to allow for detailed planning and mobilization and the smoothest possible transition from prime power to its successor. 

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