

FM 3-34.480 (FM 5-422)
April 2007

ENGINEER PRIME POWER OPERATIONS

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Preface

Field Manual (FM) 3-34.480 supports engineer, Army, and joint missions throughout full spectrum operations. This FM provides a doctrinal basis for planning and employing engineer prime power assets in the operational environment. It describes the responsibilities, relationships, capabilities, constraints, planning considerations, and logistical requirements associated with engineer prime power operations.

The fundamental purpose of this FM is to integrate engineer prime power operations into the Army strategic and operational missions and support to joint operations. The primary audiences for this FM are engineer commanders and staffs. This FM will help support commanders and staffs or those who may require prime power support to understand the engineer prime power mission. Federal, state, and local government officials will find this information useful in homeland security planning.

This publication applies to the Active Army, the Army National Guard (ARNG)/Army National Guard of the United States (ARNGUS), and the United States Army Reserve (USAR) unless otherwise stated.

Terms that have joint or Army definitions are identified in both the glossary and the text. Glossary references: The glossary lists most terms used in FM 3-34.480 that have joint or Army definitions. Terms for which FM 3-34.480 is the proponent FM (the authority) are indicated with an asterisk in the glossary. Text references: Definitions for which FM 3-34.480 is the proponent FM are printed in boldface in the text. These terms and their definitions will be incorporated into the next revision of FM 1-02. For other definitions in the text, the term is italicized, and the number of the proponent FM follows the definition.

Appendix A contains a metric conversion chart. Appendix B outlines the most frequently asked questions about prime power. Appendix C discusses the electrical specialists of each Service of the U.S. military and the special role they play within their respective Service.

The proponent for this publication is the United States Army Training and Doctrine Command (TRADOC). Send comments and recommendations on Department of the Army (DA) Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commandant, United States Army Engineer School, ATTN: ATSE-DD, Suite 336, 320 MANSCEM Loop, Fort Leonard Wood, Missouri 65473-8929. Submit an electronic DA Form 2028 or comments and recommendations in the DA Form 2028 format by e-mail to <doctrine.engineer@wood.army.mil>.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

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Chapter 1

Electrical Power

Electrical power is an essential element of military operations. Without it, many crucial systems are unable to operate. Command and control (C2) functions are highly reliant on dependable electrical power. Administrative, health service, and logistical support operations would be jeopardized without it. Many weapons systems are dependent on electrical power for operation. The proliferation of automated data processing equipment that supports modern warfare further contributes to the dependency of the Army on electricity. This growing dependence on electricity causes an increased requirement for the quantity and quality of power for support operations. The indispensable nature of electrical power compels commanders and planners to recognize their electrical-power needs and to ensure that those needs are met.

ELECTRICAL-POWER CONTINUUM

1-1. Electrical power encompasses the entire spectrum of power generation, distribution, and transformation that supports military operations. This spectrum covers tactical power, prime power, and commercial power.

TACTICAL POWER

1-2. Tactical power is generated by a mobile electrical-power unit dedicated to supporting the missions of units engaged in combat operations. Tactical power uses two classes of generators: precise and utility. These standard military generators are highly mobile, produce low voltages, and do not require the use of transformers. They have an output capacity that ranges from 0.5 to 200 kilowatts. These generators are in the unit table of organization and equipment (TOE) and are referred to as tactical generators (TACGENS). Distribution systems for tactical power are usually very simple. They often consist of standard components, such as field wiring or the Army distribution illumination set, electrical (DISE). Installation, operation, and maintenance of TACGENS and distribution equipment are the responsibility of the using unit.

PRIME POWER

1-3. **Prime power is continuous, reliable, commercial-grade utility power produced by prime power generators. Prime power plants are comprised of the Army family of nontactical generators that are larger than 200 kilowatts and produce low- and medium-level voltage.** Typically, prime power assets are employed in the communications zone or at an intermediate staging base (ISB), but they may be used to support critical facilities or large base camps in forward areas. This nontactical power is provided on an as needed basis to support military operations as directed by the theater Army or joint task force commander.

1-4. Prime power fills the gap between tactical power and commercial power and is generally used—

- When it is not practical or economically feasible to use TACGENS.
- When commercial power is not available.
- When the benefits of increased reliability and efficiency from consolidation and centralization of power systems outweigh the time, money, and material cost of providing the power.

1-5. A prime power plant may be comprised of different types of single or multiple generator sets, from military to commercial generators. However, only utility class sets with an output capacity of 525 kilo volt-