

## 10.1: Introduction to Electrical Safety

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### Working Safely with Electricity

As a worker, you have a vested interest in working safely around electricity. It has a direct effect on how you perform your job tasks. The safe installation, maintenance, and operation of electrical equipment are essential for a safe workplace. Studies by OSHA have consistently shown that electrical accidents are a leading contributor to worker injuries and fatalities.

Electrical shock is one of the four leading causes of death in construction with electrocutions accounting on average for 3% of the worker fatalities annually.

Subpart K of the Construction Standards and Subpart S of the General Industry standards contain the requirements for electrical safety. Subpart K for construction is broken down into four major areas: Installation Safety Requirements, Safety-related Work Practices, Safety related Maintenance and Environmental Considerations and Safety requirements for Special Equipment.

Subpart S of the general industry standards contains requirements for electric utilization systems, wiring design and protection, wiring methods, components, and equipment for general use, specific purpose equipment and installations, hazardous (classified) locations, and special systems.

### Applicable Regulations

OSHA Subpart K contains the installation requirements, safety-related work practices, safety-related maintenance and environmental considerations, and safety requirements for special equipment. In addition, Section 1926.499 contains the definitions that are applicable to this part. There are also other related requirements for users, such as the National Electrical Code for installation requirements.

Subpart K of the construction standard does not cover installations used for the generation, transmission, and distribution of electrical energy, including related communications, metering, control, and transformation installations.

### Installation Safety Requirements

The scope of installation safety requirements applies to both electrical equipment and installations used to provide electrical power and light at the jobsite. The requirements apply to both temporary and permanent installations used on the jobsite, but not to pre-existing permanent installations.

### Equipment approval

Subpart K of the Construction Standard requires, as does the National Electrical Code, that all electrical conductors and equipment be approved. The difference between the two is the way in which they define "approved". The NEC defines approved as being "acceptable to the authority having jurisdiction." OSHA defines approved as being listed by a national recognized testing laboratory. This is an important distinction.

### Installation provisions

Installations provisions include: Identification of Disconnecting Means, Working Clearances, Entrance and Access to Workspace, Wiring Design and Protection, Wiring Methods and Equipment, Special Equipment Hazardous Locations, and Special systems.

### GFCI and Assured grounding program

One area in which OSHA requirements differ from the NEC is ground-fault protection for personnel. OSHA standards still permit the use of an Assured Equipment Grounding Conductor Program to protect personnel on jobsites. Since 1996, the NEC has strictly limited the use of the AEGCP to receptacles other than 15 or 20-amp, 125-volt. Even though both strategies are approved, GFCI protection has an excellent performance record with less monitoring requirements. GFCI protection is required for all 125, 15 or 20-amp receptacles on construction jobsites, no matter where the power is taken from.

GFCI protection protects employees against electrical shocks by continually monitoring the amount of current going to equipment and the amount that returns. When there is a difference of approximately 5mA the GFCI opens the circuit in as little as 1/40 of a second.

GFCI protection, where so required, can be provided by individual GFCI protected receptacles, receptacles fed through other GFCI type receptacles, receptacles protected by a GFCI circuit breaker, or cord sets incorporating listed GFCI protection.

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