Assured Grounding Program

WHAT'S AT STAKE?

The assured equipment grounding conductor program covers all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. The requirements which the program must meet are stated in 29 CFR 1926.404(b)(1)(iii), but employers may provide additional tests or procedures.

WHAT'S THE DANGER?

EQUIPMENT HAZARDS

Construction Sites

With the wide use of portable tools on construction sites, the use of flexible cords often becomes necessary. Hazards are created when cords, cord connectors, receptacles, and cord- and plug-connected equipment are improperly used and maintained. Generally, flexible cords are more vulnerable to damage than is fixed wiring. Flexible cords must be connected to devices and to fittings so as to prevent tension at joints and terminal screws.

A flexible cord may be damaged by activities on the job, by door or window edges, by staples or fastenings, by abrasion from adjacent materials, or simply by aging.

When a cord connector is wet, hazardous leakage can occur to the equipment grounding conductor and to humans who pick up that connector if they also provide a path to ground.

When the leakage current of tools is below 1 ampere, and the grounding conductor has a low resistance, no shock should be perceived. However, should the resistance of the equipment grounding conductor increase, the current through the body also will increase. Thus, if the resistance of the equipment grounding conductor is significantly greater than 1 ohm, tools with even small leakages become Hazardous.

HOW TO PROTECT YOURSELF

Responsibility / Electrical Equipment Protection

The goal is to help employers and employees responsible for electrical equipment provide protection against 120-volt electrical hazards on the construction site—the most common being ground fault electrical shock—through the **use of GFCIs or through the assured equipment grounding conductor program.**

INSULATION AND GROUNDING

Insulation and grounding are two recognized means of preventing injury during electrical equipment operation.

- Conductor insulation may be provided by placing nonconductive material such as plastic around the conductor.
- Grounding may be achieved through the use of a direct connection to a known ground such as a metal, cold water pipe.

Electrical Shock Hazard

Consider, the metal housing or enclosure around a motor or the metal box in which electrical switches, circuit breakers, and controls are placed. Such enclosures protect the equipment from dirt and moisture and prevent accidental contact with exposed wiring, however, there is a hazard associated with housings and enclosures. A malfunction within the equipment—such as deteriorated insulation—may create an electrical shock hazard. Many metal enclosures are connected to a ground to eliminate the hazard.

“Hot” Wire

If a “hot” wire contacts a grounded enclosure, a ground fault results which normally will trip a circuit breaker or blow a fuse. Metal enclosures and containers are usually grounded by connecting them with a wire going to ground. This wire is called an equipment grounding conductor. Most portable electric tools and appliances are grounded by this means. There is one disadvantage to grounding: a break in the grounding system may occur without the user’s knowledge.

RECOGNIZED REQUIREMENTS

Insulation

Insulation may be damaged by hard usage on the job or simply by aging. If this damage causes the conductors to become exposed, the hazards of shocks, burns, and fire will exist. Double insulation may be used as additional protection on the live parts of a tool, but double insulation does not provide protection against defective cords and plugs or against heavy moisture conditions.

Ground

OSHA ground-fault protection rules and regulations have been determined necessary and appropriate for employee safety and health. Therefore, it is the employer’s responsibility to provide either: (a) GFCIs on construction sites for receptacle outlets in use and not part of the permanent wiring of the building or structure; or (b) a scheduled and recorded assured equipment grounding conductor program on construction sites, covering all cord sets, receptacles which are not part of the permanent wiring of the building or structure, and equipment connected by cord and plug which are available for use or used by employees.

Employer Responsibility

The employer is required to provide approved GFCIs for all 120-volt, single-phase, 15- and 20-ampere receptacle outlets on construction sites that are not a part of the permanent wiring of the building or structure and that are in use by employees. If a receptacle or receptacles are installed as part of the permanent wiring of the building or structure and they are used for temporary electric power, GFCI protection shall be provided. Receptacles on the ends of extension cords are not part of the permanent wiring and, therefore the cord’s receptacle, must be of the GFCI type whether or not the extension cord is plugged into permanent wiring. These GFCIs monitor the current-to-the-load for leakage to ground.

ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM (AEGCP)

Minimum Requirements

If an Assured Equipment Grounding Conductor Program (AEGCP) is used in place of ground-fault circuit interrupters (GFCIs) for ground-fault protection, the following **minimum requirements** apply, though additional tests or procedures are encouraged:

1. **Written Description**

Keep a written description of the program at the jobsite. Outline specific procedures for the required equipment inspections, tests, and test schedule, and make them available to OSHA and to affected persons upon demand.

2. **Competent Person**

Designate one or more competent persons to implement the program. OSHA defines a competent person as someone who is a) qualified to identify hazards, and b) authorized to take prompt corrective measures.

3. **Visually Inspect**

Visually inspect all cord sets, attachment caps, plugs and receptacles, and any equipment connected by cord and plug, before use each day. If you see any external damage, such as deformed or missing pins, damaged insulation, etc., or discover internal damage, take the equipment out of use until it is repaired.

4. **Perform Tests**

Perform two OSHA-required tests on all electrical equipment: a continuity test, and a terminal connection test. Tests are required:

- Before first use.
- After any repairs, and before placing back in service.
- After suspected damage, and before returning to use.
- Every 3 months

Maintain a written record of the required tests, identifying all equipment that passed the test and the last date it was tested (or the testing interval). Like the program description, make it available to OSHA inspectors and affected persons upon demand.

Caveat – Beware

Even if these steps are fully implemented, the result is a level of protection inferior to that provided by GFCI. In the end, electrical contractors can meet both NEC and OSHA requirements. By using GFCI protection for their employees, they can provide a superior level of protection from electrical shock, and they can do so in a manner that is less costly than the AEGCP.

FINAL WORD

Daily vigilance of assured grounding equipment is the key to secure the safety and wellbeing of employees working in those sectors. Anything less, most certainly result in injuries and in some cases, fatalities.