

**Subpart K—Electricity**

SURFACE AND UNDERGROUND

**§ 57.12001 Circuit overload protection.**

Circuits shall be protected against excessive overloads by fuses or circuit breakers of the correct type and capacity.

**§ 57.12002 Controls and switches.**

Electric equipment and circuits shall be provided with switches or other controls. Such switches or controls shall be of approved design and construction and shall be properly installed.

**§ 57.12003 Trailing cable overload protection.**

Individual overload protection or short circuit protection shall be provided for the trailing cables of mobile equipment.

**§ 57.12004 Electrical conductors.**

Electrical conductors shall be of a sufficient size and current-carrying capacity to ensure that a rise in temperature resulting from normal operations will not damage the insulating materials. Electrical conductors exposed to mechanical damage shall be protected.

**§ 57.12005 Protection of power conductors from mobile equipment.**

Mobile equipment shall not run over power conductors, nor shall loads be dragged over power conductors, unless the conductors are properly bridged or protected.

**§ 57.12006 Distribution boxes.**

Distribution boxes shall be provided with a disconnecting device for each branch circuit. Such disconnecting devices shall be equipped or designed in such a manner that it can be determined by visual observation when such a device is open and that the circuit is deenergized, and the distribution box shall be labeled to show which circuit each device controls.

**§ 57.12007 Junction box connection procedures.**

Trailing cable and power-cable connections to junction boxes shall not be made or broken under load.

**§ 57.12008 Insulation and fittings for power wires and cables.**

Power wires and cables shall be insulated adequately where they pass into or out of electrical compartments. Cables shall enter metal frames of motors, splice boxes, and electrical compartments only through proper fittings. When insulated wires, other than cables, pass through metal frames, the holes shall be substantially bushed with insulated bushings.

**§ 57.12010 Isolation or insulation of communication conductors.**

Telephone and low-potential signal wire shall be protected, by isolation or suitable insulation, or both, from contacting energized power conductors or any other power source.

**§ 57.12011 High-potential electrical conductors.**

High-potential electrical conductors shall be covered, insulated, or placed to prevent contact with low potential conductors.

**§ 57.12012 Bare signal wires.**

The potential on bare signal wires accessible to contact by persons shall not exceed 48 volts.

**§ 57.12013 Splices and repairs of power cables.**

Permanent splices and repairs made in power cables, including the ground conductor where provided, shall be—

- (a) Mechanically strong with electrical conductivity as near as possible to that of the original;
- (b) Insulated to a degree at least equal to that of the original, and sealed to exclude moisture; and,
- (c) Provided with damage protection as near as possible to that of the original, including good bonding to the outer jacket.

**§ 57.12014 Handling energized power cables.**

Power cables energized to potentials in excess of 150 volts, phase-to-ground, shall not be moved with equipment unless sleds or slings, insulated from such equipment, are used. When such energized cables are moved manually, insulated hooks, tongs, ropes, or slings shall be used unless suitable protection

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for persons is provided by other means. This does not prohibit pulling or dragging of cable by the equipment it powers when the cable is physically attached to the equipment by suitable mechanical devices, and the cable is insulated from the equipment in conformance with other standards in this part.

**§ 57.12016 Work on electrically-powered equipment.**

Electrically powered equipment shall be deenergized before mechanical work is done on such equipment. Power switches shall be locked out or other measures taken which shall prevent the equipment from being energized without the knowledge of the individuals working on it. Suitable warning notices shall be posted at the power switch and signed by the individuals who are to do the work. Such locks or preventive devices shall be removed only by the persons who installed them or by authorized personnel.

**§ 57.12017 Work on power circuits.**

Power circuits shall be deenergized before work is done on such circuits unless hot-line tools are used. Suitable warning signs shall be posted by the individuals who are to do the work. Switches shall be locked out or other measures taken which shall prevent the power circuits from being energized without the knowledge of the individuals working on them. Such locks, signs, or preventive devices shall be removed only by the person who installed them or by authorized personnel.

**§ 57.12018 Identification of power switches.**

Principal power switches shall be labeled to show which units they control, unless identification can be made readily by location.

**§ 57.12019 Access to stationary electrical equipment or switchgear.**

Where access is necessary, suitable clearance shall be provided at stationary electrical equipment or switchgear.

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**§ 57.12020 Protection of persons at switchgear.**

Dry wooden platforms, insulating mats, or other electrically-nonconductive material shall be kept in place at all switchboards and power-control switches where shock hazards exist. However, metal plates on which a person normally would stand and which are kept at the same potential as the grounded, metal, non-current-carrying parts of the power switches to be operated may be used.

**§ 57.12021 Danger signs.**

Suitable danger signs shall be posted at all major electrical installations.

**§ 57.12022 Authorized persons at major electrical installations.**

Areas containing major electrical installations shall be entered only by authorized persons.

**§ 57.12023 Guarding electrical connections and resistor grids.**

Electrical connections and resistor grids that are difficult or impractical to insulate shall be guarded, unless protection is provided by location.

**§ 57.12025 Grounding circuit enclosures.**

All metal enclosing or encasing electrical circuits shall be grounded or provided with equivalent protection. This requirement does not apply to battery-operated equipment.

**§ 57.12026 Grounding transformer and switchgear enclosures.**

Metal fencing and metal buildings enclosing transformers and switchgear shall be grounded.

**§ 57.12027 Grounding mobile equipment.**

Frame grounding or equivalent protection shall be provided for mobile equipment powered through trailing cables.

**§ 57.12028 Testing grounding systems.**

Continuity and resistance of grounding systems shall be tested immediately after installation, repair, and modification; and annually thereafter.