(f) Couplers for power circuits; guidelines for construction

Couplers that are used with medium-voltage or high-voltage power circuits shall be of the three-phase type with a full metallic shell, except that the Secretary may permit, under such guidelines as he may prescribe, no less effective couplers constructed of materials other than metal. Couplers shall be adequate for the voltage and current expected. All exposed metal on the metallic couplers shall be grounded to the ground conductor in the cable. The coupler shall be constructed so that the ground check continuity conductor shall be broken first and the ground conductors shall be broken last when the coupler is being uncoupled.

(g) Connections of single-phase loads

Single-phase loads, such as transformer primaries, shall be connected phase to phase.

(h) Installation of underground transmission cables

All underground high-voltage transmission cables shall be installed only in regularly inspected air courses and haulageways, and shall be covered, buried, or placed so as to afford protection against damage, guarded where men regularly work or pass under them unless they are six and one-half feet or more above the floor or rail, securely anchored, properly insulated, and guarded at ends, and covered, insulated, or placed to prevent contact with trolley wires and other low-voltage circuits.

(i) Disconnection devices; location; visual observation of position of switch

Disconnecting devices shall be installed at the beginning of branch lines in high-voltage circuits and equipped or designed in such a manner that it can be determined by visual observation that the circuit is deenergized when the switches are open.

(j) Circuit breakers and disconnection devices; markings

Circuit breakers and disconnecting switches underground shall be marked for identification.

(k) Splices in cables used as trailing cables; terminations and splices in other cables

In the case of high-voltage cables used as trailing cables, temporary splices shall not be used and all permanent splices shall be made in accordance with section 866(e) of this title. Terminations and splices in all other high-voltage cables shall be made in accordance with the manufacturer's specifications.

(*l*) Grounding of frames of underground equipment

Frames, supporting structures, and enclosures of stationary, portable, or mobile underground high-voltage equipment and all high-voltage equipment supplying power to such equipment receiving power from resistance grounded systems shall be effectively grounded to the high-voltage ground.

(m) Moving of power centers, transformers, and cables; deenergizing; exceptions; safety guidelines; record of examinations

Power centers and portable transformers shall be deenergized before they are moved from one location to another, except that, when equipment powered by sources other than such centers or transformers is not available, the Secretary may permit such centers and transformers to be moved while energized, if he determines that another equivalent or greater hazard may otherwise be created, and if they are moved under the supervision of a qualified person, and if such centers and transformers are examined prior to such movement by such person and found to be grounded by methods approved by an authorized representative of the Secretary and otherwise protected from hazards to the miner. A record shall be kept of such examinations. High-voltage cables, other than trailing cables, shall not be moved or handled at any time while energized, except that, when such centers and transformers are moved while energized as permitted under this subsection, energized high-voltage cables attached to such centers and transformers may be moved only by a qualified person and the operator of such mine shall require that such person wear approved and tested insulated wireman's gloves.

(Pub. L. 91–173, title III, § 308, Dec. 30, 1969, 83 Stat. 780.)

REFERENCES IN TEXT

For the operative date of this subchapter, referred to in subsec. (d), see section 509 of Pub. L. 91–173, set out as an Effective Date note under section 801 of this title.

§ 869. Underground low- and medium-voltage alternating current circuits

(a) Circuits providing power for three-phase equipment; circuit breakers

Low- and medium-voltage power circuits serving three-phase alternating current equipment shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained as prescribed by the Secretary. Such breakers shall be equipped with devices to provide protection against under-voltage, grounded phase, short circuit, and over-current.

(b) Circuits used underground; direct neutral grounds; ground conductors for frames; exceptions; grounding resistors

Low- and medium-voltage three-phase alternating-current circuits used underground shall contain either a direct or derived neutral which shall be grounded through a suitable resistor at the power center, and a grounding circuit, originating at the grounded side of the grounding resistor, shall extend along with the power conductors and serve as a grounding conductor for the frames of all the electrical equipment supplied power from that circuit, except that the Secretary or his authorized representative may permit ungrounded low- and medium-voltage circuits to be used underground to feed such stationary electrical equipment if such circuits are either steel armored or installed in grounded rigid steel conduit throughout their entire length. The grounding resistor, where required, shall be of the proper ohmic value to limit the ground fault current to 25 amperes. The grounding resistor shall be rated for maximum fault current continuously and insulated from ground for a voltage equal to the phase-to-phase voltage of the system.

(c) Inclusion of fail safe ground check circuits in resistance ground systems; operative functions; time extension; couplers for power circuits; guidelines for construction

Six months after the operative date of this subchapter, low- and medium-voltage resistance grounded systems shall include a fail safe ground check circuit to monitor continuously the grounding circuit to assure continuity which ground check circuit shall cause the circuit breaker to open when either the ground or pilot check wire is broken, or other no less effective device approved by the Secretary or his authorized representative to assure such continuity, except that an extension of time, not in excess of twelve months, may be permitted by the Secretary on a mine-by-mine basis if he determines that such equipment is not available. Cable couplers shall be constructed so that the ground check continuity conductor shall be broken first and the ground conductors shall be broken last when the coupler is being uncoupled.

(d) Disconnecting devices installed in conjunction with circuit breakers; purpose; trailing cables for mobile equipment; guidelines for construction; time extension; splices

Disconnecting devices shall be installed in conjunction with the circuit breaker to provide visual evidence that the power is disconnected. Trailing cables for mobile equipment shall contain one or more ground conductors having a cross sectional area of not less than one-half the power conductor, and, six months after the operative date of this subchapter, an insulated conductor for the ground continuity check circuit or other no less effective device approved by the Secretary or his authorized representative to assure such continuity, except that an extension of time, not in excess of twelve months may be permitted by the Secretary on a mine-by-mine basis if he determines that such equipment is not available. Splices made in the cables shall provide continuity of all components.

(e) Connections of single phase loads

Single phase loads shall be connected phase to phase.

(f) Circuit breakers; markings

Circuit breakers shall be marked for identification.

(g) Trailing cables for medium voltage circuits; guidelines for construction

Trailing cables for medium voltage circuits shall include grounding conductors, a ground check conductor, and ground metallic shields around each power conductor or a grounded metallic shield over the assembly, except that on equipment employing cable reels, cables without shields may be used if the insulation is rated 2,000 volts or more.

(Pub. L. 91–173, title III, § 309, Dec. 30, 1969, 83 Stat. 782.)

REFERENCES IN TEXT

For the operative date of this subchapter, referred to in subsecs. (c) and (d), see section 509 of Pub. L. 91–173, set out as an Effective Date note under section 801 of this title.

§ 870. Trolley wires and trolley feeder wires

(a) Intervals for cutoff switches

Trolley wires and trolley feeder wires shall be provided with cutout switches at intervals of not more than 2,000 feet and near the beginning of all branch lines.

(b) Overcurrent protection devices

Trolley wires and trolley feeder wires shall be provided with overcurrent protection.

(c) Location of wires

Trolley wires and trolley feeder wires, high-voltage cables and transformers shall not be located inby the last open crosscut and shall be kept at least 150 feet from pillar workings.

(d) Adequate insulation and guard devices; promulgation of safety guidelines

Trolley wires, trolley feeder wires, and bare signal wires shall be insulated adequately where they pass through doors and stoppings, and where they cross other power wires and cables. Trolley wires and trolley feeder wires shall be guarded adequately (1) at all points where men are required to work or pass regularly under the wires; (2) on both sides of all doors and stoppings; and (3) at man-trip stations. The Secretary or his authorized representatives shall specify other conditions where trolley wires and trolley feeder wires shall be adequately protected to prevent contact by any person, or shall require the use of improved methods to prevent such contact. Temporary guards shall be provided where trackmen and other persons work in proximity to trolley wires and trolley feeder wires.

(Pub. L. 91–173, title III, § 310, Dec. 30, 1969, 83 Stat. 783.)

§ 871. Fire protection

(a) Firefighting equipment; promulgation of minimum requirements for equipment; existing requirements; examinations after blasting

Each coal mine shall be provided with suitable firefighting equipment adapted for the size and conditions of the mine. The Secretary shall establish minimum requirements for the type, quality, and quantity of such equipment, and the interpretations of the Secretary or the Director of the United States Bureau of Mines relating to such equipment in effect on the operative date of this subchapter shall continue in effect until modified or superseded by the Secretary. After every blasting operation, an examination shall be made to determine whether fires have been started.

(b) Underground storage areas for lubricating oils and greases; construction; exceptions

Underground storage places for lubricating oil and grease shall be of fireproof construction. Except for specially prepared materials approved by the Secretary, lubricating oil and grease kept in all underground areas in a coal mine shall be in fireproof, closed metal containers or other no less effective containers approved by the Secretary.

(c) Housing of underground structures, stations, shops, and pumps; construction; ventilation

Underground transformer stations, battery-charging stations, substations, compressor sta-