



WEST VIRGINIA BOARD OF COAL MINE HEALTH AND SAFETY

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PROPOSED REGULATIONS

To: All persons interested in Rules and Regulations constructed by the Board of Coal Mine Health and Safety

From: Joel L. Watts, Administrator – BCMH&S

Subject: Rules and Regulations Governing High Voltage Longwalls, Title 36, Section 47

Date: 2 November 2009

End Date for Comments: 2 December 2009

Authority: §22.6.1

The Board of Coal Mine Health and Safety is posting a proposed regulation regarding the governing of high voltage longwalls, circuits and equipment. This regulation, if passed, will invalidate any and all existing waivers granted by the Technical Review Committee regarding high voltage long wall equipment.

You may send all written comments to

1615 Washington Street East
Charleston, WV 25311

All comments must be post-marked by December 2nd in order to be accepted by the Board for consideration.

36 CSR 47

TITLE 36
LEGISLATIVE RULES
BOARD OF COAL MINE HEALTH AND SAFETY

SERIES 47
RULES AND REGULATIONS GOVERNING HIGH VOLTAGE LONGWALLS

§ 36-47-1. General.

1.1 Scope. To govern electrical safety standards that apply to high-voltage longwall circuits and equipment. All other existing standards in West Virginia State Mining Laws, Rules and Regulations or in 30 CFR MSHA Regulations must also apply to these longwall circuits and equipment where appropriate.

1.2 Authority. W. Va. Code §§ 22A-6-1 *et seq.*

1.3 Filing Date. _____

1.4 Effective Date. _____

§ 36-47-2. Effect of Law and Regulations.

(a) These regulations shall have the effect of law and violations shall be deemed a violation of law and so cited with the same effect as law.

§ 36-47-3 Electrical protection.

(a) High-voltage circuits must be protected against short circuits, overloads, ground faults, and undervoltages by circuit-interrupting devices of adequate interrupting capacity as follows:

(1) Current settings of short-circuit protective devices must not exceed the setting specified in approval documentation, or seventy-five percent of the minimum available phase-to-phase short-circuit current, whichever is less.

2) Time-delay settings of short-circuit protective devices used to protect any cable extending from the section power center to a motor- starter enclosure must not exceed the settings specified in approval documentation, or 0.25-second, whichever is less. Time delay settings of short-circuit protective devices used to protect motor and shearer circuits must not exceed the settings specified in approval documentation, or 3 cycles, whichever is less.

3) Ground-fault currents must be limited by a neutral grounding resistor to not more than--

i) 6.5 amperes when the nominal voltage of the power circuit is 2,400 volts or less; or

ii) 3.75 amperes when the nominal voltage of the power circuit exceeds 2,400 volts.

4) High-voltage circuits extending from the section power center must be provided with--

i) Ground-fault protection set to cause deenergization at not more than 40 percent of the current rating of the neutral grounding resistor;

ii) A backup ground-fault detection device to cause deenergization when a ground fault occurs with the neutral grounding resistor open; and

iii) Thermal protection for the grounding resistor that will deenergize the longwall power center if the resistor is subjected to a sustained ground fault. The thermal protection must operate at either 50 percent of the maximum temperature rise of the grounding resistor, or 150 deg. C (302 deg. F), whichever is less, and must open the ground-wire monitor circuit for the high-voltage circuit supplying the section power center. The thermal protection must not be dependent upon control power and may consist of a current transformer and overcurrent relay.

5) High-voltage motor and shearer circuits must be provided with instantaneous ground-fault protection set at not more than 0.125- ampere.

6) Time-delay settings of ground-fault protective devices used to provide coordination with the instantaneous ground-fault protection of motor and shearer circuits must not exceed 0.25-second.

7) Undervoltage protection must be provided by a device which operates on loss of voltage to cause and maintain the interruption of power to a circuit to prevent automatic restarting of the equipment.

b) Current transformers used for the ground-fault protection specified in paragraphs (a)(4)(i) and (5) of this section must be single window-type and must be installed to encircle all three phase conductors. Equipment safety grounding conductors must not pass through or be connected in series with ground-fault current transformers.

c) Each ground-fault current device specified in paragraphs (a)(4)(i) and (5) of this section must be provided with a test circuit that will inject a primary current of 50 percent or less of the current rating of the grounding resistor through the current transformer and cause each corresponding circuit-interrupting device to open.

d) Circuit-interrupting devices must not reclose automatically.

e) Where two or more high-voltage cables are used to supply power to a common bus in a high-voltage enclosure, each cable must be provided with ground-wire monitoring. The ground-wire monitoring circuits must cause deenergization of each cable when either the ground-monitor or grounding conductor(s) of any cable become severed or open. All connected cables on newly installed longwalls must be protected as follows:

1) When one circuit-interrupting device is used to protect parallel connected cables, the circuit-interrupting device must be electrically interlocked with the cables so that the device will open when any cable is disconnected; or

2) When two or more parallel circuit-interrupting devices are used to protect parallel connected cables, the circuit-interrupting devices must be mechanically and electrically interlocked. Mechanical interlocking must cause all devices to open simultaneously and electrical interlocking must cause all devices to open when any cable is disconnected.

§ 36-47-4 Disconnect devices.

(a) The section power center must be equipped with a main disconnecting device installed to deenergize all cables extending to longwall equipment when the device is in the "open" position.

(b) Disconnecting devices for motor-starter enclosures must be maintained in accordance with the approval requirements set forth by Title 30 CFR § 18.53 of paragraph (f). The compartment for the disconnect device must be provided with a caution label to warn miners against entering the compartment before deenergizing the incoming high-voltage circuits to the compartment.

(c) Disconnecting devices must be rated for the maximum phase-to-phase voltage of the

circuit in which they are installed, and for the full-load current of the circuit that is supplied power through the device.

(d) Each disconnecting device must be designed and installed so that --

- (1) Visual observation determines that the contacts are open without removing any cover;
- (2) All load power conductors can be grounded when the device is in the "open" position; and
- (3) The device can be locked in the "open" position.

(e) Disconnecting devices, except those installed in explosion-proof enclosures, must be capable of interrupting the full-load current of the circuit or designed and installed to cause the current to be interrupted automatically prior to the opening of the contacts of the device.

Disconnecting devices installed in explosion-proof enclosures must be maintained in accordance with the approval requirements as set forth by the code of Federal Regulations 30 CFR § 18.53 paragraph (f)(2)(iv).

§ 36-47-5-Guarding of cables.

(a) High-voltage cables must be guarded at the following locations:

- (1) Where persons regularly work or travel over or under the cables.
- (2) Where the cables leave cable handling or support systems to extend to electric components.

(b) Guarding must minimize the possibility of miners contacting the cables and protect the cables from damage. The guarding must be made of grounded metal or nonconductive flame-resistant material.

§ 36-47-6 Cable handling and support systems.

(a) Longwall mining equipment must be provided with cable-handling and support systems that are constructed, installed and maintained to minimize the possibility of miners contacting the cables and to protect the high-voltage cables from damage.

§ 36-47-7 Use of insulated cable handling equipment.

(a) Energized high-voltage cables must not be handled except when motor or shearer cables need to be trained. When cables need to be trained, high-voltage insulated gloves, mitts, hooks, tongs, slings, aprons, or other personal protective equipment capable of providing protection against shock hazard must be used to prevent direct contact with the cable.

(b) High-voltage insulated gloves, sleeves, and other insulated personal protective equipment must--

(1) Have a voltage rating of at least Class 1 (7,500 volts) that meets or exceeds ASTM F496-97, "Standard Specification for In-Service Care of Insulating Gloves and Sleeves" (1997).

(2) Be examined before each use for visible signs of damage;

(3) Be electrically tested every thirty days after initial use and, every year when properly stored and not in use. This must be done in accordance with publication ASTM F496-97.

(4) Be removed from the underground area of the mine or destroyed when damaged or defective.

(5) A record of insulated cable handling equipment must be made, kept in a book prescribed by the Director and made available to all interested persons upon request.

§ 36-47-8 Motor-starter enclosures; barriers and interlocks.

Compartment separation and cover interlock switches for motor- starter enclosures must be maintained in accordance with the approval requirements as set fourth by MSHA

§ 36-47-9 Electrical work; troubleshooting and testing.

(a) Electrical work on all circuits and equipment associated with high-voltage longwalls must be performed only by persons certified. No electrical work shall be performed on low-, medium-, or high-voltage distribution circuits or equipment, except by a certified person or by a person trained to perform electrical work and to maintain electrical equipment under the direct supervision of a certified person.

(b) Prior to performing electrical work, except for troubleshooting and testing of energized circuits and equipment as provided for in paragraph (d) of this section, a certified person must do the following:

(1) Deenergize the circuit or equipment with a circuit-interrupting device.

(2) Open the circuit disconnecting device. On high-voltage circuits, ground the power conductors until work on the circuit is completed.

(3) Lock out the disconnecting device with a padlock. When more than one certified person is performing work, each person must install an individual padlock.

(4) Tag the disconnecting device to identify each person working and the circuit or equipment on which work is being performed.

(c) Each padlock and tag must be removed only by the person who installed them, except that, if that person is unavailable at the mine, the lock and tag may be removed by a person authorized by the operator, provided--

(1) The authorized person is qualified under paragraph (a) of this section; and

(2) The operator ensures that the person who installed the lock and tag is aware of the removal before that person resumes work on the affected circuit or equipment.

(d) Troubleshooting and testing of energized circuits must be performed only--

(1) On low- and medium-voltage circuits;

(2) When the purpose of troubleshooting and testing is to determine voltages and currents; and

(3) By persons certified to perform electrical work and who wear protective gloves on circuits that exceed 40 volts but is less than 1000 volts. Gloves must be tested in accordance with the following

(a) Class 0 gloves (used at less than 1000 volts) must be electrically tested every 6 months when in use and every year when not in use and properly stored. A record of these gloves must be kept in a book prescribed by the Director and made available for authorized representatives of the West Virginia Office of Miner's Health, Safety and Training upon request.

(4) Rubber insulating gloves must be rated at least for the nominal voltage of the circuit when the voltage of the circuit exceeds 40 volts.

(e) Before troubleshooting and testing a low- or medium-voltage circuit contained in a compartment with a high-voltage circuit, the high-voltage circuit must be deenergized,

disconnected, grounded, locked out and tagged in accordance with paragraph (b) of this section.

(f) Prior to the installation or removal of conveyor belt structure, high-voltage cables extending from the section power center to longwall equipment and located in the belt entries must be:

- (1) Deenergized; or
- (2) Guarded in accordance with of this part, at the location where the belt structure is being installed or removed; or
- (3) Located at least 6.5 feet above the mine floor.

§ 36-47-10 Testing, examination and maintenance.

(a) At least once every 7 days, a person certified in accordance with West Virginia State Mining Laws, Rules and Regulations shall perform electrical work on all circuits and equipment must test and examine each unit of high-voltage longwall equipment and circuits to determine that electrical protection, equipment grounding, permissibility, cable insulation, and control devices are being properly maintained to prevent fire, electrical shock, ignition, or operational hazards from existing on the equipment. Tests must include activating the ground-fault test circuit as required by this section.

(b) Each ground-wire monitor and associated circuits must be examined and tested at least once each 30 days to verify proper operation and that it will cause the corresponding circuit-interrupting device to open.

(c) When examinations or tests of equipment reveal a fire, electrical shock, ignition, or operational hazard, the equipment must be removed from service immediately or repaired immediately.

(d) At the completion of examinations and tests required by this section, the person who makes the examinations and tests must certify by signature and date that they have been conducted. A record must be made of any unsafe condition found and any corrective action taken. Certifications and records must be kept for at least one year and must be made available for inspection by authorized representatives of the Office of Miners' Health, Safety and Training and representatives of miners.

§ 36-47-11 Underground high-voltage longwall cables.

(a) In addition to the high-voltage cable design specifications, high-voltage cables for use on longwalls may be a type SHD cable with a center ground-check conductor no smaller than a No. 16 AWG stranded conductor. The cables must be MSHA accepted as flame-resistant.