Title 36
Legislative Rules
Board of Coal Mine Health & Safety

~~WEST VIRGINIA ADMINISTRATIVE REGULATIONS~~

~~DEPARTMENT OF MINES~~

~~CHAPTER 22 4~~

SERIES ~~20~~ 9

SUBJECT: RULES AND REGULATIONS GOVERNING ELECTRICAL PROVISIONS IN SHAFT AND/OR SLOPE CONSTRUCTION OPERATIONS WITHIN THE STATE OF WEST VIRGINIA

~~TYPE OF RULE:~~ LEGISLATIVE

Section 1. General 1/ Scope ~ Same

1.01 Authority - These rules and regulations are issued under ~~authority~~ of West Virginia Code, Chapter ~~22~~ 22A, Article ~~2A~~ 6, Section ~~4.~~ 4

1.02 Effective Date - These rules and regulations were promulgated on the 26th day of September, 1980 and became effective on the 1st day of December, 1980.

1.03 Filing Date - These rules and regulations were filed in the Office of the Secretary of State on the 8th day of October, 1980.

Section 2. Effect of Regulations

2.01 The rules and 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. All provisions of Chapter ~~22~~ 22A, Article ~~1~~ 1A, of the West Virginia Code relative to enforcement are applicable to the enforcement of these rules and regulations.

Section 3. Definitions

3.01 Approved - The term "approved" shall mean in strict compliance with mining law, or in the absence of law, accepted by a recognized standardizing body or organization whose approval is generally recognized as authoritative on the subject.

3.02 Permissible - The term "permissible" shall mean any equipment, device or explosive that has been approved as permissible by the United States Bureau of Mines and meets all requirements, restrictions, exceptions, limitations and conditions attached to such classification by the Bureau.

3.03 Certified Electrician - The term "certified electrician" shall mean any person who is qualified as a mine electrician and who has passed an examination given by the Department of Mines, or has at least three years of experience in performing electrical work underground in a coal mine, in the surface work areas of an underground coal mine, in a surface coal mine, in a non-coal mine, in the mine equipment manufacturing industry, or in any other industry using or manufacturing similar equipment, and has satisfactorily completed an electrical training program approved by the Department of Mines.

3.04 Armored Cable - The term "armored cable" shall mean a cable provided with a wrapping of metal, usually steel wires or tapes, primarily for the purpose of mechanical protection.

3.05 Borehole Cable - The term "borehole cable" shall mean a cable designed for vertical suspension in a borehole or shaft and used for power circuits in the mine.

3.06 Cable - The term "cable" shall mean a standard conductor (single conductor cable) or a combination of conductors insulated from one another, (multiple conductor cable.)

3.07 Flame-Resistant Cable, Portable - The term "flame-resistant cable, portable" shall mean a protable flame-resistant cable that has passed the flame tests of the federal bureau of mines.

3.08 Portable (Trailing) Cable - The term "portable (trailing) cable" shall mean a flexible cable or cord used for connecting mobile, portable or stationary equipment to an external source of electric energy where permanent mine wiring is prohibited or is impracticable.

3.09 Branch Circuit - The term "branch circuit" shall mean any circuit, alternating current or direct current, connected to and leading from the main power lines.

3.10 Circuit Breaker - The term "circuit breaker" shall mean a device for interrupting a circuit between separable contacts under normal or abnormal conditions.

3.11 Zig-zag Transformer (Grounding Transformer) - The term "zig-zag transformer (grounding transformer)" shall mean a transformer intended primarily to provide a neutral point for grounding purposes.

3.12 Neutral Point - The term "neutral point" shall mean the connection point of transformer or generator windings from which the voltage to ground is nominally zero, and is the point generally used for system groundings in wye-connected a.c. power system.

3.13 Neutral (Derived) - The term "neutral (derived)" shall mean a neutral point or connection established by the addition of a zig-zag or grounding transformer to a normally ungrounded power system.

3.14 Effectively Grounded - The term "effectively grounded" is an expression which means grounded through a grounding connection of sufficiently low impendance (inherent or intentionally added or both) so that fault grounds which may occur cannot build up voltages in excess of limits established for apparatus, circuits or systems so grounded.

3.15 Grounded (Earthed) - The term "grounded (earthed)" shall mean

that the system, circuit, or apparatus referred to is provided with a ground.

3.16 Ground or Grounding Conductor (Mining) - The term "ground or grounding conductor (mining)", also referred to as a safety ground conductor, safety ground and frame ground, shall mean a metallic conductor used to connect the metal frame or enclosure of any equipment, mine track device or wiring system to an effective grounding medium.

3.17 Delta Connected - The term "delta connected" shall mean a power system in which the windings or transformers or a.c. generators are connected to form a triangular phase relationship, and with phase conductors connected to each point of the triangle.

3.18 Wye-connected - The term "wye-connected" shall mean a power system connection in which one end of each phase windings or transformers or a.c. generators are connected together to form a neutral point, and a neutral conductor may or may not be connected to the neutral point, and the neutral point may or may not be grounded.

3.19 High Voltage - The term "high voltage" shall mean voltages of more than one thousand volts.

3.20 Medium Voltage - The term "medium voltage" shall mean voltages from six hundred sixty-one to one thousand volts.

3.21 Low Voltage - The term "low voltage" shall mean up to and including six hundred sixty volts.

3.22 Lightning Arrester - The term "lightning arrester" shall mean a protective device for limiting surge voltage on equipment by discharging or bypassing surge current to ground, and is capable of repeating these functions as specified.

3.23 Power Center or Distribution Center - The term "power center or distribution center" shall mean a combined transformer or distribution unit, complete within a metal enclosure from which one or more power circuits are taken.

Section 4. Electrical Provisions - Shaft and/or Slope

4.01 Power circuits and electric equipment shall be deenergized before work is done on such circuits and equipment, except when necessary for troubleshooting or testing.

4.02 No electrical work shall be performed on electric distribution circuits or equipment, except by a qualified person or by a person trained to perform electrical work and to maintain electrical equipment under the direct supervision of a qualified person. Disconnecting devices shall be locked out and suitably tagged by the persons who perform such work, except that in cases where locking out is not possible, such devices shall be opened and suitable tagged by such persons who installed them, or, if such persons are unavailable, by persons authorized by the operator of his agent.

4.03 Electrical equipment shall be examined weekly, tested monthly, and properly maintained by a qualified person to assure safe operating conditions. When a potentially dangerous condition is found on electric equipment, such equipment shall be removed from service until such condition is corrected. A record of such examination shall be kept and made available to an authorized representative of the director of the department of mines and to the miners in such mine.

4.04 Surface transformers shall be elevated at least eight feet above the ground or enclosed by a fence six feet high, grounded if metal; shall be properly grounded; shall be installed so that they will not present a fire

hazard; and shall be guarded by sufficient danger signs. The gate or door to the enclosure shall be kept locked at all times, unless authorized persons are present.

4.05 Electric conductors shall be sufficient in size and have adequate current carrying capacity and be of such construction that a rise in temperature resulting from normal operation will not damage the insulating materials.

4.06 Electrical connections or splices in electric conductors shall be mechanically and electrically efficient, and suitable connectors shall be used. All electrical connections or splices in electrical connections or splices in insulated wire shall be reinsulated at least to the same degree of protection as the remainder of the wire.

4.07 Short circuit protection to protect all electric equipment and circuits against short circuits and overloads, shall be provided by an automatic circuit breaker or other no less effective device approved by the Director of the Department of Mines. Three-phase motors on all electric equipment shall be provided with overload protection that will deenergize all three phases in the event that any phase is overloaded.

4.08 The booms and masts of equipment operated on the surface of any shaft or slope shall not be operated within 10 feet of an energized overhead powerline. Where the voltage of overhead powerlines is 69,000 volts or more the minimum distance from the boom or mast shall be as follows:

Nominal power line voltage (in 1,000 volts)	Minimum distance (feet)
69 - 114	12
115 - 229	15
230 - 344	20
345 - 499	25
500 or more	35

4.09 During construction electrical equipment employed below the collar or within 25 feet of the return or exhaust of a slope or shaft during excavation shall be approved or permissible and shall be maintained in a permissible condition.

4.10 The insulation of all electric conductors employed below the collar of any slope and shaft during excavation shall be of the flame resistant type.

4.11 During the construction of shaft or slope only lamps and portable flood lights approved by the Bureau of Mines shall be permitted below the collar of the shaft or slope.

4.12 Metallic frames, casings, and other emclosures of electric equipment that can become "alive" through failure of insulation or by contact with energized parts shall be effectively grounded.

4.13 All power wires (except trailing cables on mobile equipment, specially designed cables conducting high-voltage power to underground rectifying equipment or transformers, or bare or insulated ground and return wires) shall be supported on well-insulated insulators and shall not contact combustible material, roof, or ribs.

4.14 Well-insulated insulators is interpreted to mean well-installed insulators. Insulated J-hooks may be used to suspend insulated power cables for temporary installation not exceeding six months and for permanend installation of control cables such as may be used along belt conveyors.

4.15 Power wires and cables shall be insulated adequately and fully protected.

4.16 Power wires and cable shall have insulation with a dielectric strength at least equal to the voltage of the circuit.

4.17 Each ungrounded, exposed power conductor and each ungrounded exposed telephone wire that leads underground shall be equipped with suitable

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lightning arresters of approved type within 100 feet of the point where the circuit enters the mine. Lightning arresters shall be connected to a low resistance grounding medium on the surface which shall be separated from neutral grounds by a distance of not less than 25 feet.

4.18 Short circuit protection for trailing cables shall be provided by an automatic circuit breaker or other no less effective device approved by the director of the department of mines of adequate current-interrupting capacity in each ungrounded conductor. Disconnecting devices used to disconnect power from trailing cables shall be plainly marked and identified and such devices shall be equipped or designed in such a manner that it can be determined by visual observation that the power is disconnected.

Section 5. Lights to be used in shaft

5.01 Only approved cap lights shall be used in shafts. Lights shall be suspended in shafts by cable or chain other than the power conductor. In slopes lights must be substantially installed. Power cables shall be of an approved type.

Power cables shall not be taunt from shaft collar to light. Power cables shall be in good condition and splices shall be:

(A) Mechanically strong with adequate electric conductivity and flexibility

(B) Effectively insulated and sealed so as to exclude moisture, and

(C) Vulcanized or otherwise treated with suitable materials to provide flame-resistant qualities and good bonding to outer jacket.

Lights shall be suspended not less than 20 feet above where men are working.

Lights and power shall not be restored in work area of shaft or slope until examination has been made for gas by the shaft-slope examiner and found clear. Fronts of lights need not be guarded with a metal guard providing light is permissible with an approved lense.

Section 6. Applicability of Mining Laws

6.01 All provisions of the Mining Laws of this state intended to safeguard life or property shall extend to all Shaft and Slope Construction Operations insofar as such laws are applicable to thereto.