

1 **H. B. 2318**

2
3 (By Delegate Caputo)

4 [Introduced January 12, 2011; referred to the
5 Committee on Energy, Industry and Labor, Economic
6 Development and Small Business then the Judiciary.]

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11 A BILL to amend and reenact §22A-2-40 of the Code of West Virginia,
12 1931, as amended, relating to requiring that permanent and
13 temporary battery charging stations in mines be ventilated
14 directly to the return on a separate split of air.

15 *Be it enacted by the Legislature of West Virginia:*

16 That §22A-2-40 of the Code of West Virginia, 1931, as amended,
17 be amended and reenacted to read as follows:

18 **ARTICLE 2. UNDERGROUND MINES.**

19 **ELECTRICITY.**

20 **§22A-2-40. General provisions.**

21 Operators of coal mines in which electricity is used as a
22 means of power shall comply with the following provisions:

23 (1) All surface transformers, unless of a construction which

1 will eliminate shock hazards, or unless installed at least eight
2 feet above ground, shall be enclosed in a house or surrounded by a
3 fence at least six feet high. If the enclosure is of metal, it
4 shall be grounded effectively. The gate or door to the enclosure
5 shall be kept locked at all times, unless authorized persons are
6 present.

7 (2) Underground transformers shall be air cooled or cooled
8 with noninflammable liquid or inert gas.

9 (3) Underground stations containing circuit breakers filled
10 with inflammable liquids shall be put on a separate split of air or
11 ventilated directly to the return air, and shall be of fireproof
12 construction.

13 (4) Transformers shall be provided with adequate overload
14 protection.

15 (5) "Danger -- High Voltage" signs with the voltage indicated
16 shall be posted conspicuously on all transformer enclosures, high-
17 potential switchboards and other high-potential installations.

18 (6) Dry insulating platforms of rubber or other suitable
19 nonconductive material shall be kept in place at each switchboard
20 and at stationary machinery where shock hazards exist.

21 (7) Capacitors used for power factor correction shall be
22 noninflammable liquid filled. Suitable drain-off resistors or
23 other means to protect miners against electric shock following
24 removal of power shall be provided.

1 (8) All unattended underground loading points where electric
2 driven hydraulic systems are used shall utilize a fireproof oil or
3 emulsion.

4 (9) Before electrical changes are made to permissible
5 equipment for use in a mine, they shall be approved by the
6 director.

7 (10) Reverse current protection shall be provided at storage
8 battery charging stations to prevent the storage batteries from
9 energizing the power circuits in the event of power failure.

10 (11) In all mines all junction or distribution boxes used for
11 making multiple power connections inby the last open crosscut shall
12 be permissible.

13 (12) All hand-held electric drills, blower and exhaust fans,
14 electric pumps and ~~such~~ other low horsepower electric face
15 equipment which are taken into or used inby the last open crosscut
16 of any coal mine ~~shall be~~ are permissible.

17 (13) All electric face equipment which is taken into or used
18 inby the last open crosscut of any coal mine ~~shall be~~ are
19 permissible.

20 (14) In mines operated in coal seams which are located at
21 elevations above the water table, the phrase "coal seams above the
22 water table" means coal seams in a mine which are located at an
23 elevation above a river or the tributary of a river into which a
24 local surface water system naturally drains.

1 (15) The operator of each coal mine shall maintain in
2 permissible condition all electric face equipment, which is taken
3 into or used in by the last open crosscut of any mine.

4 (16) Except where permissible power connection units are used,
5 all power-connection points out by the last open crosscut shall be
6 in intake air.

7 (17) All power circuits and electric equipment shall be
8 deenergized before work is done on such circuits and equipment,
9 except when necessary for trouble shooting or testing.

10 (18) Energized trolley wires may be repaired only by a person
11 trained to perform electrical work and to maintain electrical
12 equipment and the operator of a mine shall require that ~~such~~ those
13 persons wear approved and tested insulated shoes and wireman's
14 gloves.

15 (19) No electrical work ~~shall~~ may be performed on low- medium-
16 or high-voltage distribution circuits or equipment, except by a
17 qualified person or by a person trained to perform electrical work
18 and to maintain electrical equipment under the direct supervision
19 of a qualified person. Disconnecting devices shall be locked out
20 and suitably tagged by the persons who perform ~~such~~ the work,
21 except that in cases where locking out is not possible, ~~such~~ the
22 devices shall be opened and suitably tagged by ~~such~~ the persons who
23 installed them, or, if ~~such~~ those persons are unavailable, by
24 persons authorized by the operator or his or her agent.

1 (20) All electric equipment shall be examined weekly, tested,
2 and properly maintained by a qualified person to assure safe
3 operating conditions. When a potentially dangerous condition is
4 found on electric equipment, ~~such~~ the equipment shall be removed
5 from service until ~~such~~ the condition is corrected. A record of
6 ~~such~~ the examinations shall be kept and made available to an
7 authorized representative of the director and to the miners in ~~such~~
8 the mine.

9 (21) All electric conductors shall be sufficient in size and
10 have adequate current-carrying capacity and be of such construction
11 that a rise in temperature resulting from normal operation will not
12 damage the insulating material.

13 (22) All electrical connections or splices in conductors shall
14 be mechanically and electrically efficient, and suitable connectors
15 shall be used. All electrical connections or splices in insulated
16 wire shall be reinsulated at least to the same degree of protection
17 as the remainder of the wire.

18 (23) Cables shall enter metal frames of motors, splice boxes
19 and electric compartment only through proper fittings. When
20 insulated wire, other than cables, pass through metal frames, the
21 holes shall be substantially bushed with insulated bushings.

22 (24) All power wire (except trailing cables on mobile
23 equipment, specially designed cables conducting high-voltage power
24 to underground rectifying equipment or transformers, or bare or

1 insulated ground and return wires) shall be supported on well-
2 installed insulators and ~~shall~~ may not contact combustible
3 material, roof or ribs.

4 (25) Power wires and cables, including, but not limited to,
5 phone communication and control wires, except trolley wires,
6 trolley feeder wires and bare signal wires, shall be insulated
7 adequately and fully protected. The provisions of this subdivision
8 shall not become effective until January 1, 1978.

9 (26) Automatic circuit-breaking devices or fuses of the
10 correct type and capacity shall be installed so as to protect all
11 electric equipment and circuits against short circuit and
12 overloads. Three-phase motors on all electric equipment shall be
13 provided with overload protection that will deenergize all three
14 phases in the event that any phase is overloaded.

15 (27) Incandescent lamps installed along haulageways and at
16 other locations shall not contact combustible material, and if
17 powered from trolley or direct current feeder circuits, need not be
18 provided with separate short circuits or overload protection, if
19 the lamp is not more than eight feet in distance from ~~such~~ the
20 circuits.

21 (28) In all main power circuits, disconnecting switches shall
22 be installed underground within five hundred feet of the bottoms of
23 shafts and boreholes through which main power circuits enter the
24 underground area of the mine and within five hundred feet of all

1 other places where main power circuits enter the underground area
2 of the mine.

3 (29) All electric equipment shall be provided with switches or
4 other controls that are safely designed, constructed and installed.

5 (30) Each underground, exposed power conductor that leads
6 underground shall be equipped with suitable lightning arrestors of
7 approved type within one hundred feet of the point where the
8 circuit enters the mine. Lightning arrestors shall be connected to
9 a low-resistance grounding medium on the surface which shall be
10 separated from neutral ground by a distance of not less than
11 twenty-five feet.

12 (31) Except for areas of a coal mine inby the last open
13 crosscut, incandescent lamps may be used to illuminate underground
14 areas. When incandescent lamps are used in a track entry or belt
15 entry or near track entries to illuminate special areas other than
16 structures, the lamps shall be installed in weatherproof sockets
17 located in positions ~~such~~ so that the lamps will not come in
18 contact with any combustible material. Lamps used in all other
19 places must be of substantial construction and be fitted with a
20 glass enclosure.

21 (32) An authorized representative of the director may require
22 in any mine that electric face equipment be provided with devices
23 that will permit the equipment to be deenergized quickly in the
24 event of an emergency.

1 (33) An authorized representative of the director shall
2 require manually operated emergency stop switches, designed to
3 deenergize the traction motor circuit when the contractors or
4 controller fail to open, to be installed on all battery powered
5 tractors, taken into or used in by the last open crosscut of any
6 entry or room.

7 (34) Trailing cables used in coal mines shall meet the
8 requirements for flame-resistant cables.

9 (35) Short circuit protection for trailing cables shall be
10 provided by an automatic circuit breaker or other no less effective
11 device approved by the director of adequate current-interrupting
12 capacity in each ungrounded conductor. Disconnecting devices used
13 to disconnect power from trailing cables shall be plainly marked
14 and identified and ~~such~~ the devices shall be equipped or designed
15 in ~~such~~ a manner that it can be determined by visual observation
16 that the power is disconnected.

17 (36) When two or more trailing cables junction to the same
18 distribution center, means shall be provided to assure against
19 connecting a trailing cable to the wrong size circuit breaker.

20 (37) One temporary splice may be made in any trailing cable.
21 ~~Such~~ The trailing cable may only be used for the next twenty-four
22 hour period. No temporary splice ~~shall~~ may be made in a trailing
23 cable within twenty-five feet of the machine, except cable reel
24 equipment. Temporary splices in trailing cables shall be made in

1 a workmanlike manner and shall be mechanically strong and well
2 insulated. Trailing cables or hand cables which have exposed wires
3 or which have splices that heat or spark under load ~~shall~~ may not
4 be used. As used in this section, the term "splice" means a
5 mechanical joining of one or more conductors that have been
6 severed.

7 (38) When permanent splices in trailing cables are made, they
8 shall be:

9 (A) Mechanically strong with adequate electrical conductivity
10 and flexibility;

11 (B) Effectively insulated and sealed so as to exclude
12 moisture; and

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

16 (39) Trailing cables shall be clamped to machines in a manner
17 to protect the cables from damage and to prevent strain on the
18 electrical connections. No cables ~~will~~ may be hung in a manner
19 which will damage the insulation or conductors.

20 (40) Trailing cables shall be adequately protected to prevent
21 damage by mobile equipment.

22 (41) Trailing cable and power cable connections to junction
23 boxes and to electrical equipment ~~shall~~ may not be made or broken
24 under load.

1 (42) All metallic sheaths, armors and conduits enclosing power
2 conductors shall be electrically continuous throughout and shall be
3 grounded by methods approved by an authorized representative of the
4 director.

5 (43) Except where waived by the director, metallic frames,
6 casings and other enclosures of electric equipment that can become
7 alive through failure of insulation or by contact with energized
8 parts shall be grounded, and on or before January 1, 1978, shall
9 have a ground monitoring system.

10 (44) In instance where single-phase 110-220 volt circuits are
11 used to feed electrical equipment, the only method of grounding
12 that will be approved is the connection of all metallic frames,
13 casings and other enclosure of ~~such~~ the equipment to a separate
14 grounding conductor which establishes a continuous connection to a
15 grounded center tap of the transformer.

16 (45) The attachment of grounding wires to a mine tract or
17 other grounded power conductor will be approved if separate clamps,
18 suitable for ~~such~~ the purpose, are used and installed to provide a
19 solid connection.

20 (46) The frames of all offtrack direct-current machines and
21 the enclosures of related detached components shall be effectively
22 grounded or otherwise maintained at no less safe voltages.

23 (47) Installation of silicon diodes shall be restricted to
24 electric equipment receiving power from a direct-current system

1 with one polarity grounded. Where ~~such~~ the diodes are used on
2 circuits having a nominal voltage rating of two hundred fifty, they
3 must have a forward current rating of four hundred amperes or more,
4 and have a peak inverse voltage rating of four hundred or more.

5 Where ~~such~~ the diodes are used on circuits having nominal voltage
6 rating of five hundred fifty, they must have a forward current
7 rating of two hundred fifty amperes or more, and have a peak
8 inverse voltage rating of eight hundred or more.

9 (48) In addition to the grounding diode, a polarizing diode
10 must be installed in the machine control circuit to prevent
11 operation of the machine when the polarity of a trailing cable is
12 reversed.

13 (49) When installed on permissible equipment, all grounding
14 diodes, over-current devices and polarizing diodes must be placed
15 in explosion-proof compartments.

16 (50) High-voltage lines, both on the surface and underground,
17 shall be deenergized and grounded before work is performed on them,
18 except that repairs may be permitted, in the case of energized
19 surface high-voltage lines, if ~~such~~ the repairs are made by a
20 qualified person in accordance with procedures and safeguards,
21 including, but not limited to, a requirement that the operator of
22 ~~such~~ the mine provide, test and maintain protective devices in
23 making ~~such~~ the repairs.

24 (51) When two or more persons are working on an energized

1 high-voltage surface line simultaneously, and any one of them is
2 within reach of another, ~~such~~ these persons ~~shall~~ may not ~~be~~
3 ~~allowed to~~ work on different phases or on equipment with different
4 potentials.

5 (52) All persons performing work on energized high-voltage
6 surface lines shall wear protective rubber gloves, sleeves and
7 climber guards if climbers are worn. Protective rubber gloves
8 ~~shall~~ may not be worn wrong side out or without protective leather
9 gloves. Protective devices worn by a person assigned to perform
10 repairs on high-voltage surface lines shall be worn continuously
11 from the time he or she leaves the ground until he or she returns
12 to the ground and, if ~~such~~ the devices are employed for extended
13 periods, ~~such~~ that person shall visually inspect the equipment
14 assigned him or her for defects before each use and, in no case,
15 less than twice each day.

16 (53) Disconnecting or cutout switches on energized high-
17 voltage surface lines shall be operated only with insulated sticks,
18 fuse tongs or pullers which are adequately insulated and maintained
19 to protect the operator from the voltage to which he or she is
20 exposed. When ~~such~~ the switches are operated from the ground, the
21 person operating ~~such~~ the devices shall wear protective rubber
22 gloves.

23 (54) Solely for purposes of grounding ungrounded high-voltage
24 power systems, grounded messenger wires used to suspend the cables

1 of ~~such~~ the systems may be used as a grounding medium.

2 (55) When not in use, power circuits underground shall be
3 deenergized on idle days and idle shifts, except that rectifiers
4 and transformers may remain energized.

5 (56) High-voltage circuits entering the underground area of
6 any coal mine shall be protected by suitable circuit breakers of
7 adequate interrupting capacity. ~~Such~~ The breakers shall be
8 equipped with devices to provide protection against undervoltage,
9 grounded phase, short circuit and overcurrent.

10 (57) Circuit breakers protecting high-voltage circuits
11 entering an underground area of any coal mine shall be located on
12 the surface and in no case installed either underground or within
13 a drift.

14 (58) One circuit breaker may be used to protect two or more
15 branch circuits, if the circuit breaker is adjusted to afford
16 overcurrent protection for the smallest conductor.

17 (59) The grounding resistor, where required, shall be of the
18 proper ohmic value to limit the voltage drop in the grounding
19 circuit external to the resistor to not more than one hundred volts
20 under fault conditions. The grounding resistor shall be rated for
21 maximum fault current continuously and insulated from ground for a
22 voltage equal to the phase-to-phase voltage of the system.

23 (60) High-voltage circuits extending underground and supplying
24 portable mobile or stationary high-voltage equipment shall contain

1 either a direct or derived neutral which shall be grounded through
2 a suitable resistor at the source transformers, and a grounding
3 circuit, originating at the grounded side of the grounding
4 resistor, shall extend along with the power conductors and serve as
5 a grounding conductor for the frames of all high-voltage equipment
6 supplied power from the circuit, except that the director or his or
7 her authorized representative may permit ungrounded high-voltage
8 circuits to be extended underground to feed stationary electrical
9 equipment if ~~such~~ the circuits are either steel armored or
10 installed in grounded, rigid steel conduit throughout their entire
11 length, and upon his or her finding that such exception does not
12 pose a hazard to the miners. Within one hundred feet of the point
13 on the surface where high-voltage circuits enter the underground
14 portion of the mine, disconnecting devices shall be installed and
15 so equipped or designed in ~~such~~ a manner that it can be determined
16 by visual observation that the power is disconnected, except that
17 the director or his or her authorized representative may permit
18 ~~such~~ the devices to be installed at a greater distance from ~~such~~
19 the area of the mine if he or she determines, based on existing
20 physical conditions, that ~~such~~ the installation will be more
21 accessible at a greater distance and will not pose any hazard to
22 the miners.

23 (61) High-voltage resistance grounded systems serving portable
24 or mobile equipment shall include a fail-safe ground check circuit

1 to monitor continuously the grounding circuit to assure continuity,
2 and the fail-safe ground check circuit shall cause the circuit
3 breaker to open when either the ground or pilot check wire is
4 broken, or other no less effective device approved by the director
5 or his or her authorized representative to assure ~~such~~ continuity.

6 (62) Underground high-voltage cables used in resistance
7 grounded systems shall be equipped with metallic shields around
8 each power conductor with one or more ground conductors having a
9 total cross-sectional area of not less than one-half the power
10 conductor, and with an insulated internal or external conductor not
11 smaller than No. 10 (A.W.G.) for the ground continuity check
12 circuit.

13 (63) All ~~such~~ cables shall be adequate for the intended
14 current and voltage. Splices made in ~~such~~ the cables shall provide
15 continuity of all components.

16 (64) Single-phase loads, such as transformer primaries, shall
17 be connected phase-to-phase.

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

1 and other low-voltage circuits.

2 (66) Disconnecting devices shall be installed at the beginning
3 of branch lines in underground high-voltage circuits and equipped
4 or designed in ~~such~~ a manner that it can be determined by visual
5 observation that the circuit is deenergized when the switches are
6 open.

7 (67) Circuit breakers and disconnecting switches underground
8 shall be marked for identification.

9 (68) In the case of high-voltage cables used as trailing
10 cables, temporary splices shall not be used and all permanent
11 splices shall be made in accordance with the manufacturers'
12 specifications.

13 (69) Frames, supporting structures and enclosures of
14 stationary, portable or mobile underground high-voltage equipment
15 and all high-voltage equipment supplying power to ~~such~~ the
16 equipment receiving power from resistance grounded systems shall be
17 effectively grounded to the high-voltage ground.

18 (70) Low- and medium-voltage power circuits serving three-
19 phase alternating current equipment serving portable or mobile
20 equipment shall be protected by suitable circuit breakers of
21 adequate interrupting capacity which are properly tested and
22 maintained as prescribed by the director. ~~Such~~ The breakers shall
23 be equipped with devices to provide protection against
24 undervoltage, grounded phase, short circuit and overcurrent.

1 (71) Power centers and portable transformers shall be
2 deenergized before they are moved from one location to another,
3 except that, when equipment powered by sources other than ~~such~~ the
4 centers or transformers is not available, the director may permit
5 ~~such~~ the centers and transformers to be moved while energized, if
6 he or she determines that another equivalent or greater hazard may
7 otherwise be created, and if they are moved under the supervision
8 of a qualified person, and if ~~such~~ the centers and transformers are
9 examined prior to ~~such~~ the movement by ~~such~~ that person and found
10 to be grounded by methods approved by an authorized representative
11 of the director and otherwise protected from hazards to the miner.
12 A record shall be kept of ~~such~~ these examinations. High-voltage
13 cables, other than trailing cables, ~~shall~~ may not be moved or
14 handled at any time while energized, except that when ~~such~~ the
15 centers and transformers are moved while energized as permitted
16 under this section, energized high-voltage cables attached to ~~such~~
17 the centers and transformers may be moved only by a qualified
18 person and the operator of ~~such~~ the mine shall require that ~~such~~
19 the person wear approved and tested insulated wireman's gloves.

20 (72) Low- and medium-voltage three-phase alternating-current
21 circuits used underground shall contain either a direct or derived
22 neutral which shall be grounded through a suitable resistor at the
23 power center, and a grounding circuit, originating at the grounded
24 side of the grounding resistor, shall extend along with the power

1 conductors and serve as a grounding conductor for the frames of all
2 the electrical equipment supplied power from the circuit, except
3 that the director or his or her authorized representative may
4 permit underground low- and medium-voltage circuits to be used
5 underground to feed ~~such~~ the stationary electrical equipment if
6 ~~such~~ the circuits are either steel armored or installed in grounded
7 rigid steel conduit throughout their entire length. The grounding
8 resistor, where required, shall be of the proper ohmic value to
9 limit the ground fault current to twenty-five amperes. The
10 grounding resistor shall be rated for maximum fault current
11 continuously and insulated from ground for a voltage equal to the
12 phase-to-phase voltage of the system.

13 (73) Low- and medium-voltage resistance grounded systems
14 serving portable or mobile equipment shall include a fail-safe
15 ground check circuit to monitor continuously the grounding circuit
16 to assure continuity which ground check circuit shall cause the
17 circuit breaker to open when either the ground or pilot check wire
18 is broken, or other not less effective device approved by the
19 director or his or her authorized representative to assure ~~such~~
20 continuity, except that an extension of time, not in excess of
21 twelve months, may be permitted by the director on a mine-to-mine
22 basis if he or she determines that ~~such~~ the equipment is not
23 available. Cable couplers shall be constructed so that the ground
24 check continuity conductor shall be broken first and the ground

1 conductors shall be broken last when the coupler is being
2 uncoupled.

3 (74) Disconnecting devices shall be installed in conjunction
4 with circuit breakers serving portable or mobile equipment to
5 provide visual evidence that the power is connected.

6 (75) Circuit breakers shall be marked for identification.

7 (76) Single-phase loads shall be connected phase-to-phase.

8 (77) Trailing cables for medium-voltage circuits shall include
9 grounding conductors, a ground check conductor, and grounded
10 metallic shields around each power conductor or a ground metallic
11 shield over the assembly, except that on equipment employing cable
12 reels, cables without shields may be used if the insulation is
13 rated two thousand volts or more.

14 (78) Trolley wires and trolley feeder wires shall be provided
15 with cutout switches at intervals of not more than two thousand
16 feet and near the beginning of all branch lines.

17 (79) Trolley wires and trolley feeder wires shall be provided
18 with overcurrent protection.

19 (80) Trolley wires and trolley feeder wires, high-voltage
20 cables and transformers ~~shall~~ may not be located within fifteen
21 feet of the last open crosscut and shall be kept at least one
22 hundred fifty feet from pillar workings.

23 (81) Trolley wires, trolley feeder wires and bare signal wires
24 shall be insulated adequately where they pass through doors and

1 stoppings and where they cross other power wires and cables.

2 Trolley wires and trolley feeder wires shall be guarded adequately:

3 (A) At all points where men are required to work or pass
4 regularly under the wires.

5 (B) On both sides of all doors and stoppings.

6 (C) At man-trip stations.

7 (82) Temporary guards shall be provided where trackmen and
8 other persons work in close proximity to trolley wires and trolley
9 feeder wires.

10 (83) Adequate precaution shall be taken to ensure that
11 equipment being moved along haulageways will not come in contact
12 with trolley wires or trolley feeder wires.

13 (84) Trolley and feeder wires shall be installed as follows:
14 Where installed on permanent haulage, they shall be:

15 (A) At least six inches outside the track gauge line.

16 (B) Kept taut and not permitted to touch the roof, rib or
17 crossbars. Particular care shall be taken where they pass through
18 door openings to preclude bare wires from coming in contact with
19 combustible material.

20 (C) Installations of trolley wire hangers shall be provided
21 within three feet of each splice in a trolley wire.

22 (85) Permanent and temporary battery charging stations shall
23 be ventilated directly to the return on a separate split of air.

NOTE: The purpose of this bill is to require that permanent and temporary battery charging stations in mines be ventilated directly to the return on a separate split of air.

Strike-throughs indicate language that would be stricken from the present law, and underscoring indicates new language that would be added.