

H. B. 2095

(By Delegate Caputo)

[Introduced January 19, 2015; referred to the
Committee on Energy then the Judiciary.]

A BILL to amend and reenact §22A-2-40 of the Code of West Virginia, 1931, as amended, relating to underground mining; requiring that permanent and temporary battery charging stations in mines be ventilated directly to the return on a separate split of air; permitting other not less effective devices to be used in lieu of fail safe ground check circuits in certain systems; and making stylistic changes.

Be it enacted by the Legislature of West Virginia:

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

ARTICLE 2. UNDERGROUND MINES.

ELECTRICITY

§22A-2-40. General provisions.

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

1 (1) All surface transformers, unless of a construction which will eliminate shock hazards or
2 unless installed at least eight 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 shall be grounded effectively. The gate
4 or door to the enclosure shall be kept locked at all times unless authorized persons are present.

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

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

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

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

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

15 (7) Capacitors used for power factor connection shall be noninflammable liquid filled.
16 Suitable drain-off resistors or other means to protect miners against electric shock following removal
17 of power shall be provided.

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

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

22 (10) Reverse current protection shall be provided at storage battery charging stations to

1 prevent the storage batteries from energizing the power circuits in the event of power failure.

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

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

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

9 (14) In mines operated in coal seams which are located at elevations above the water table,
10 the phrase "coal seams above the water table" means coal seams ~~in a mine~~ which are located at an
11 elevation above a river or the tributary of a river into which a local surface water system naturally
12 drains.

13 (15) The operator of each coal mine shall maintain in permissible condition all electric face
14 equipment which is taken into or used inby the last open crosscut of any mine.

15 (16) Except where permissible power connection units are used, all power connection points
16 outby the last open crosscut shall be in intake air.

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

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

22 (19) No electrical work ~~shall~~ may be performed on low, medium or high voltage distribution

1 circuits or equipment except by a qualified person or by a person trained to perform electrical work
2 and to maintain electrical equipment under the direct supervision of a qualified person.
3 Disconnecting devices shall be locked out and suitably tagged by the persons who perform ~~such~~ the
4 work, except that in cases where locking out is not possible, ~~such~~ the devices shall be opened and
5 suitably tagged by ~~such~~ the persons who installed them or, if ~~such~~ those persons are unavailable, by
6 persons authorized by the operator or his or her agent.

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

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

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

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

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

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

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

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

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

15 (28) In all main power circuits, disconnecting switches shall be installed underground within
16 five hundred feet of the bottoms of shafts and boreholes through which main power circuits enter
17 the underground area of the mine and within five hundred feet of all other places where main power
18 circuits enter the underground area of the mine.

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

21 (30) Each underground, exposed power conductor that leads underground shall be equipped
22 with suitable lightning arrestors of approved type within one hundred feet of the point where the

1 circuit enters the mine. Lightning arrestors shall be connected to a low resistance grounding medium
2 on the surface which shall be separated from neutral ground by a distance of not less than twenty five
3 feet.

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

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

13 (33) An authorized representative of the director shall require the installation of manually
14 operated emergency stop switches, designed to deenergize the traction motor circuit when the
15 contractors or controller fail to open, ~~to be installed~~ on all battery powered tractors taken into or used
16 inby the last open crosscut of any entry or room.

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

18 (35) Short circuit protection for trailing cables shall be provided by an automatic circuit
19 breaker or other no less effective device approved by the director of adequate current interrupting
20 capacity in each ungrounded conductor. Disconnecting devices used to disconnect power from
21 trailing cables shall be plainly marked and identified and ~~such~~ the devices shall be equipped or
22 designed in ~~such~~ a manner that it can be determined by visual observation that the power is

1 disconnected.

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

4 (37) One temporary splice may be made in any trailing cable. ~~Such~~ The trailing cable may
5 only be used for the next twenty-four hour period. No temporary splice ~~shall~~ may be made in a
6 trailing cable within twenty-five feet of the machine except cable reel equipment. Temporary splices
7 in trailing cables shall be made in a workmanlike manner and ~~shall be~~ mechanically strong and well
8 insulated. Trailing cables or hand cables which have exposed wires or which have splices that heat
9 or spark under load ~~shall~~ may not be used. As used in this section, the term "splice" means a
10 mechanical joining of one or more conductors that have been severed.

11 (38) When permanent splices in trailing cables are made, ~~they~~ these shall be:

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

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

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

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

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

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

22 (42) All metallic sheaths, armors and conduits enclosing power conductors shall be

1 electrically continuous throughout and shall be grounded by methods approved by an authorized
2 representative of the director.

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

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

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

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

15 (47) Installation of silicon diodes shall be restricted to electric equipment receiving power
16 from a direct current system with one polarity grounded. Where ~~such~~ the diodes are used on circuits
17 having a nominal voltage rating of two hundred fifty, they must have a forward current rating of four
18 hundred amperes or more and have a peak inverse voltage rating of four hundred or more. Where
19 ~~such~~ the diodes are used on circuits having nominal voltage rating of five hundred fifty, they must
20 have a forward current rating of two hundred fifty amperes or more and have a peak inverse voltage
21 rating of eight hundred or more.

22 (48) In addition to the grounding diode, a polarizing diode ~~must~~ shall be installed in the

1 machine control circuit to prevent operation of the machine when the polarity of a trailing cable is
2 reversed.

3 (49) When installed on permissible equipment, all grounding diodes, over-current devices
4 and polarizing diodes ~~must~~ shall be placed in explosion-proof compartments.

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

10 (51) When two or more persons are working on an energized high-voltage surface line
11 simultaneously and any one of them is within reach of another, ~~such~~ these persons ~~shall~~ may not be
12 ~~allowed to~~ work on different phases or on equipment with different potentials.

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

20 (53) Disconnecting or cutout switches on energized high voltage surface lines shall be
21 operated only with insulated sticks, fuse tongs or pullers which are adequately insulated and
22 maintained to protect the operator from the voltage to which he or she is exposed. When ~~such~~ the

1 switches are operated from the ground, the person operating ~~such~~ the devices shall wear protective
2 rubber gloves.

3 (54) Solely for purposes of grounding ungrounded high voltage power systems, grounded
4 messenger wires used to suspend the cables of ~~such~~ the systems may be used as a grounding medium.

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

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

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

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

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

19 (60) High voltage circuits extending underground and supplying portable mobile or stationary
20 high voltage equipment shall contain either a direct or derived neutral which shall be grounded
21 through a suitable resistor at the source transformers. ~~and~~ A grounding circuit, originating at the
22 grounded side of the grounding resistor, shall extend along with the power conductors and serve as

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

13 (61) High-voltage resistance grounded systems serving portable or mobile equipment shall
14 include a fail safe ground check circuit to monitor continuously the grounding circuit to assure
15 continuity and the fail safe ground check circuit shall cause the circuit breaker to open when either
16 the ground or pilot check wire is broken or other no less effective device approved by the director
17 or his or her authorized representative to assure ~~such~~ continuity.

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

22 (63) All ~~such~~ cables shall be adequate for the intended current and voltage. Splices made in

1 ~~such~~ the cables shall provide continuity of all components.

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

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

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

12 (67) Circuit breakers and disconnecting switches underground shall be marked for
13 identification.

14 (68) In the case of high-voltage cables used as trailing cables, temporary splices ~~shall~~ may
15 not be used and all permanent splices shall be made in accordance with the manufacturers'
16 specifications.

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

21 (70) Low and medium voltage power circuits serving three phase alternating current
22 equipment serving portable or mobile equipment shall be protected by suitable circuit breakers of

1 adequate interrupting capacity which are properly tested and maintained as prescribed by the director.
2 ~~Such~~ The breakers shall be equipped with devices to provide protection against undervoltage,
3 grounded phase, short circuit and overcurrent.

4 (71) Power centers and portable transformers shall be deenergized before ~~they are~~ moved
5 from one location to another. ~~except that,~~ When equipment powered by sources other than ~~such~~ the
6 centers or transformers is not available, the director may permit ~~such~~ the centers and transformers
7 to be moved while energized if:

8 (A) He or she determines that another equivalent or greater hazard may otherwise be created;
9 ~~and if they~~

10 (B) The centers and transformers are moved under the supervision of a qualified person; ~~and~~
11 ~~if such~~ and

12 (C) The centers and transformers are examined prior to ~~such~~ movement by ~~such~~ the qualified
13 person and found to be grounded by methods approved by an authorized representative of the
14 director and otherwise protected from hazards to the miner.

15 A record shall be kept of ~~such~~ these examinations. High voltage cables, other than trailing
16 cables, ~~shall~~ may not be moved or handled at any time while energized ~~except that when such~~ while
17 energized except when the centers and transformers are moved while energized as permitted under
18 this section. Energized high-voltage cables attached to ~~such~~ the centers and transformers may be
19 moved only by a qualified person and the operator of ~~such~~ the mine shall require that ~~such~~ the person
20 wear approved and tested insulated wireman's gloves.

21 (72) Low and medium voltage, three phase, alternating current circuits used underground
22 shall contain either a direct or derived neutral which ~~shall be~~ is grounded through a suitable resistor

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

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

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

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

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

2 (77) Trailing cables for medium voltage circuits shall include grounding conductors, a ground
3 check conductor and grounded metallic shields around each power conductor or a ground metallic
4 shield over the assembly. ~~except that~~ On equipment employing cable reels, cables without shields
5 may be used if the insulation is rated two thousand volts or more.

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

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

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

12 (81) Trolley wires, trolley feeder wires and bare signal wires shall be insulated adequately
13 where they pass through doors and stoppings and ~~where they~~ cross other power wires and cables.
14 Trolley wires and trolley feeder wires shall be guarded adequately:

15 (A) At all points where ~~men~~ persons are required to work or pass regularly under the wires;

16 (B) On both sides of all doors and stoppings; and

17 (C) At man trip stations.

18 (82) Temporary guards shall be provided where trackmen and ~~other persons~~ others work in
19 close proximity to trolley wires and trolley feeder wires.

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

22 (84) Trolley and feeder wires, ~~shall be installed as follows:~~ where installed on permanent

1 haulage, they shall be:

2 (A) At least six inches outside the track gauge line;

3 (B) Kept taut and not permitted to touch the roof, rib or crossbars ~~Particular care shall be~~

4 ~~taken where they pass~~ with particular care taken where passing through door openings to preclude

5 bare wires from coming in contact with combustible material; and

6 ~~(C) Installations of trolley wire hangers shall be provided~~ Trolley wire hangers installed

7 within three feet of each splice in a trolley wire.

8 (85) Permanent and temporary battery charging stations shall be ventilated directly to the

9 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 in underground mines. The bill permits other not less effective devices to be used in lieu of fail safe ground check circuits in certain systems. The bill also makes stylistic changes.

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