

In the matter of  
Bowie Resources Limited  
Bowie No. 3 Mine  
I.D. No. 05-04758

Petition for Modification

Docket No. M-2003-081-C

PROPOSED DECISION AND ORDER

On October 21, 2003, a petition was filed seeking a modification of the application of 30 CFR 75.1002 to Petitioner's Bowie No. 3 Mine, located in Delta County, Colorado. The modification being sought is for a high-voltage continuous miner previously granted a modification of the same standard at the company's Bowie #2 Mine under Docket No. M-2003-023-C, issued September 3, 2003, and finalized October 3, 2003. The Petitioner alleges that the alternative method outlined in the petition will at all times guarantee no less than the same measure of protection afforded by the standard.

MSHA personnel conducted an investigation of the petition and filed a report of their findings and recommendations with the Administrator for Coal Mine Safety and Health. After a careful review of the entire record, including the petition, and MSHA's investigative report and recommendation, this Proposed Decision and Order was issued.

Finding of Fact and Conclusion of Law

The alternative method proposed by the Petitioner (as amended by the recommendations of MSHA) will at all times guarantee no less than the same measure of protection afforded the miners under 30 CFR 75.1002.

MSHA's investigation confirmed that the high-voltage continuous miner and electrical components proposed for use at the No. 3 Mine are the same machinery previously investigated at the No. 2 Mine.

On the basis of the petition and the findings of MSHA's investigation, Bowie Resources Limited is granted a modification of the application of 30 CFR 75.1002 to its Bowie No. 3 Mine.

When this Proposed Decision and order becomes final it will supercede and fully replace the modification granted under Docket No. M-2003-023-C, issued September 3, 2003.

ORDER

Wherefore, pursuant to the authority delegated by the Secretary of Labor to the Administrator for Coal Mine Safety and Health, and pursuant to Section 101(c) of the Federal Mine Safety and Health Act of 1977, 30 U.S.C., Sec. 811(c), it is ordered that Bowie Resources Limited's Petition for Modification of the application of 30 CFR 75.1002 in the Bowie No. 3 Mine is hereby:

GRANTED, for the use of the 2400-volt high-voltage continuous miner(s) at the Bowie No. 3 Mine, conditioned upon compliance with the following terms and conditions:

1. The nominal voltage of power circuits must not exceed 2400-volts.
2. The nominal voltage of the control circuits must not exceed 120-volts.
3. Each output circuit from the power center must be equipped with an MSHA approved ground-wire monitoring system. Each receptacle must be interlocked with the ground-wire monitor circuit such that the circuit-interrupting device will open when the trailing cable is disconnected from the power center receptacle.
4. The trailing cable extending to the high-voltage continuous mining machine must be protected against short-circuits, overloads, ground-faults, and undervoltage by a circuit interrupting device of adequate interrupting capacity as follows:
  - (a) Trailing cable protection.
    - (1) Short-circuit protection.
      - (i) The current setting must be either the setting specified in the approval documentation or 75 percent of the minimum available phase-to-phase short-circuit current, whichever is less.
      - (ii) The time-delay setting of the short-circuit protective device must be either the setting specified in approval documentation or 0.05 second, whichever is less.

(2) Ground-fault protection.

- (i) The ground-fault current must be limited by a neutral grounding resistor to not more than 0.5 ampere.
- (ii) A ground-fault device must cause de-energization of the circuit at not more than 0.125 ampere. The time-delay setting of the device must not exceed 0.050 second.
- (iii) A look-ahead circuit must detect a ground condition and prevent the circuit interrupting device from closing.
- (iv) A backup ground-fault device must cause deenergization of the circuit at not more than 40 percent of the voltage developed across the neutral grounding resistor when a ground-fault occurs with the neutral grounding resistor open. The time delay setting of the backup device must not exceed 0.25 second.
- (v) A thermal device must detect a sustained ground-fault current in the neutral grounding resistor and deenergize the incoming power. The device must operate at either 50 percent of the maximum temperature rise of the grounding resistor, or 150<sup>0</sup> C (302<sup>0</sup> F), whichever is less. The thermal protection must not be dependent upon control power and may consist of a current transformer and overcurrent relay in the grounding resistor circuit.
- (vi) A single window-type current transformer that encircles all three-phase conductors must be used to activate the ground-fault current device specified in (a)(2)(ii). The equipment grounding conductor(s) must not pass through the current transformer.
- (vii) A test circuit for the ground-fault device specified in (a)(2)(ii) must inject no more than 50 percent of the current rating of the neutral grounding resistor through the current transformer. When the test circuit is activated, the circuit-interrupting device must open.

- (3) Undervoltage protection.
  - (i) The undervoltage device must operate on a loss of voltage, deenergize the circuit, and prevent the equipment from automatically restarting.
- (b) Circuit-interrupting devices must not reclose automatically.
- (c) If a ground-fault indicator light is provided on a high-voltage continuous mining machine and it indicates a grounded phase, the following procedures must be implemented:
  - (1) The continuous mining machine must be moved immediately to a location with a properly supported roof; and
  - (2) The ground-fault must be located and corrected prior to placing the continuous mining machine back into operation.
- (d) All components that provide short-circuit protection must have an interruption rating in accordance with maximum short-circuit currents available in by that circuit interrupting device(s), and must be rated for the maximum phase-to-phase voltage of the circuit.
- (e) Installation and guarding of trailing cables.
  - (1) Trailing cable installation.

The portion of the high-voltage trailing cable from the power center to the following locations must be either supported on insulators or located in an unused entry which is barricaded from vehicular travel and provided with warning signs:

    - (i) The last open crosscut during advance mining;
    - (ii) Within 150 feet of the working place during retreat or second mining; or
    - (iii) Up to 150 feet of the continuous mining machine when the machine is used in outby areas to cut overcasts, underpasses, sumps; to clean rock falls, and for other similar functions.

(2) Temporary storage.

Item (4)(e) does not preclude the temporary lacing of cable into a sled or a crosscut. The sled or crosscut used for this purpose must be barricaded against vehicular or foot travel and equipped with high-voltage warning signs.

(3) Guarding.

The high-voltage trailing cable must be guarded in the following locations using grounded metal or nonconductive flame-resistant material:

- (i) Between the power center and the first cable insulator, if supported, or where the cable enters the used entry;
- (ii) From the entrance gland for a minimum distance of 10 feet out by the last strain clamp on the continuous mining machine; and
- (iii) At any location where the trailing cable may be damaged by moving equipment.

(4) Suspended cable or cable crossover.

When equipment must cross any portion of the high-voltage trailing cable, the cable must be either:

- (i) Suspended from the mine roof; or
- (ii) Protected by a cable crossover with the following characteristics:
  - a. Have a minimum length of 33 inches;
  - b. Have a minimum width of 17 inches;
  - c. Have a minimum height of 3 inches;
  - d. Have a cable placement area that is a minimum of two and one half inches (2 ½") high by four and one quarter inches (4 ¼") wide;
  - e. Use nonconductive material for the crossover;
  - f. Use material for the crossover that is colored a highly distinctive color. The color black shall not be used; and

- g. The material for the crossovers shall have a minimum tensile strength of 6400 pounds per square inch.

5. Trailing cable design.

The high-voltage trailing cable must be designed as follows:

- (a) The high-voltage trailing cable must have 100 percent semi-conductor tape shielding and metallic braid shielding coverage over each insulated power conductor;
- (b) The protective jacket must consist of two layers, an outer and inner protective jacket;
- (c) The color black must not be used for either of the two protective insulation layers;
- (d) The innermost layer of the two layered insulation jackets must be colored a distinctive color from the outer jacket to allow easy recognition of damaged areas to the outer protective jacket insulation;
- (e) Be MSHA accepted as flame-resistant under part 18 or approved under subpart k of part 7; and
- (f) Meet either the requirements of 75.804 or be a type SHD cable with a center ground-check conductor not smaller than No. 16 A.W.G. stranded conductor.

6. Trailing cable handling and pulling.

- (a) Miners must not handle the energized trailing cable unless they are wearing properly tested and rated insulating gloves as specified in Item # 11. If mitts, hooks, tongs, slings, aprons, or other personal protective equipment are used to handle energized cables, high-voltage insulating gloves must be used in conjunction to provide protection against shock hazards.
- (b) The trailing cable must be deenergized prior to being pulled by any equipment other than the continuous mining machine.

7. Splicing and repair of cables.

Splices and repairs to high-voltage trailing cables must comply with the following:

- (a) Be made only by a qualified person as provided in 30 CFR 75.153 who has received hands-on training in the proper methods of splicing and repairing these high-voltage trailing cables;
- (b) Be made in a workman-like manner and in accordance with the instructions of the manufacturer of the repair materials;
- (c) Be made in accordance with 30 CFR 75.810. The outer jacket of each splice or repair shall be vulcanized with flame-resistant material or made with a kit that has been accepted by MSHA as flame-resistant. Each splice or major repair shall be made so that all cable components are replaced with similar components. Repairs are considered major if there is any damage to the metallic shielding, semi-conductor tape, inner conductor insulation, or conductors. Minor repairs to the outer cable jacket may be made by using tape accepted by MSHA as flame-resistant;
- (d) Permanent tape-type splices in any high-voltage trailing cable are prohibited. Only MSHA approved high-voltage splice kits containing outer jacket repairs and splices will be acceptable; and
- (e) Splicing of the high-voltage trailing cable within 35 feet of the continuous miner is prohibited.

8. Power centers.

- (a) The power center(s) supplying power to the high-voltage continuous mining machine shall be equipped with a main disconnecting device installed to deenergize the primary of all transformers when the device is in the open position.
- (b) All compartments that provide access to energized high-voltage conductors or parts must have the following:
  - (1) Barriers and covers that prevent miners from contacting high-voltage conductors or parts.
  - (2) A caution label(s) to warn miners against entering the compartment(s) before de-energizing the incoming high-voltage circuits.
- (c) The power center must also be equipped with a disconnecting device that deenergizes the trailing cable when the device is in the open position.
- (d) Each disconnecting device must be designed and installed as follows:

- (1) Rated for the maximum phase-to-phase voltage of the circuit in which they are installed;
  - (2) Rated for the full-load current of the circuit that is supplied power through the device;
  - (3) It can be determined by visual observation that the contacts are open without removing any cover;
  - (4) Marked to clearly identify the circuit it disconnects;
  - (5) Grounds all power conductors on the load side when the device is in the "open" position;
  - (6) Can be locked in the "open" position; and,
  - (7) Capable of interrupting the full-load current of the circuit, or designed to cause automatic deenergization of the current prior to opening the disconnecting device.
- (e) The control circuit must be interlocked with the main disconnecting device in the power center so that:
- (1) When the primary disconnecting device is in the "open" position, the control circuit can only be powered through an auxiliary switch in the test position; and
  - (2) When the primary disconnecting device is in the "closed" position, the control circuit can be powered only through an auxiliary switch in the normal position.
- (f) Each cover or removable barrier providing access to energized high-voltage conductors or parts must be equipped with at least two interlock switches. Removal of any of these covers must automatically deenergize the incoming high-voltage to the power center.
- (g) The power center must be equipped with an emergency stop switch that deenergizes the incoming high-voltage in the event of an emergency.
- (h) The power center must be equipped with a grounding stick to discharge the high-voltage capacitors and circuits. The power center must have a label readily identifying the location of the grounding stick. The grounding stick must be stored in a dry location.

9. Electrical work; troubleshooting and testing.

- (a) Electrical work on all circuits associated with high-voltage continuous mining machines must be performed only by persons qualified under 30 CFR 75.153.
- (b) Prior to performing electrical work on the high-voltage trailing cable and the continuous mining machine, except for trouble shooting and testing, the energized circuits and equipment as provided for in item (e) of this section, a qualified person must
  - (1) Open the circuit disconnecting device;
  - (2) Disconnect the cable coupler; and
  - (3) Connect the cable coupler to a grounding receptacle.
    - (i) A dust cover must be used on the receptacle from which the cable was disconnected.
    - (ii) When trouble shooting, the deenergized high-voltage cable may be disconnected from the grounding receptacle only for that period of time necessary to locate and determine the fault condition. The high-voltage cable must be reconnected to the grounding receptacle prior to work being performed to correct the defective condition.
  - (4) Lockout the cable coupler with a padlock. When more than one qualified person is performing work, each person must install an individual padlock; and
  - (5) Tag the cable coupler to identify the circuit on which work is being performed. When more than one person is performing work, each person must tag the coupler.
- (c) Prior to performing electrical work on the power center containing high-voltage components and parts, except for troubleshooting and testing of energized circuits and equipment as provided for in item (e) of this section, a qualified person must:
  - (1) Open the main disconnecting device;
  - (2) Verify that the contacts of the main disconnecting

device are grounded;

- (3) Lockout the disconnecting device with a padlock. When more than one qualified person is performing work, each person must install an individual padlock;
  - (4) Tag the disconnecting device to identify the circuit on which work is being performed. When more than one qualified person is performing work, each person must tag the disconnecting device; and
  - (5) Discharge all high-voltage capacitors before any work is performed inside any compartment of the power center.
- (d) 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 mine operator, provided:
- (1) The authorized person is qualified under item (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.
- (e) Before troubleshooting and testing a low-or medium-voltage circuit contained in an enclosure with exposed high-voltage conductors or parts, the high-voltage circuit must be de-energized, grounded, locked-out, and tagged in accordance with items (b) or (c) of this section, whichever is applicable. Troubleshooting and testing energized circuits must be performed only:
- (1) On low- and medium-voltage circuits;
  - (2) To determine voltages and currents; and
  - (3) By persons qualified to perform electrical work under Paragraph (a) of this section and who wear protective gloves in accordance with the following

table:

CIRCUIT VOLTAGE	TYPE OF GLOVE REQUIRED
Greater than 120-volts (nominal) (not intrinsically safe)	Rubber insulating gloves with leather protectors
40-volts to 120-volts (nominal) (both intrinsically safe and non-intrinsically safe)	Either rubber insulating gloves with leather protectors or dry work gloves
Greater than 120-volts (nominal) (intrinsically safe)	Either rubber insulating gloves with leather protectors or dry work gloves

10. Frequency of examination; record keeping.

- (a) At least once every 7 days, a person qualified in accordance with 30 CFR 75.153 must test and examine high-voltage continuous mining machines to determine that electrical protection, equipment grounding, permissibility, cable insulation, and control devices are being properly installed and maintained.
- (b) At least once every 7 days, a person qualified in accordance with 30 CFR 75.153 must activate the ground-fault test circuit required in Item 4(a)(2)(vii) to verify that it will cause the corresponding circuit-interrupting device to open.
- (c) At least once every 7 days, a person qualified in accordance with 30 CFR 75.153 must examine and test each high-voltage continuous mining machine ground-wire monitor circuit to verify that it will cause the corresponding circuit-interrupting device to open.
- (d) Trailing cable must be inspected as follows:
  - (1) Once each day, a person qualified in accordance with 30 CFR 75.153 must inspect the entire length of the deenergized high-voltage trailing cable from the power center to the continuous mining

machine. The inspection must include the outer jacket repairs, all splices, and areas where guarding is required.

- (2) At the beginning of each production shift, a responsible person designated by the mine operator must visually inspect for damage the outer jacket of the de-energized high-voltage trailing cable from the last open crosscut to the continuous mining machine.
- (e) If the continuous mining machine is equipped with a grounded-phase detection circuit, the test circuit must be activated at the start of each production shift to ensure that the detection circuit is functioning properly.
- (f) When examinations or tests of equipment described in items (a) through (e) of this section reveal a potential fire, electrical shock, ignition, or operational hazard, the equipment must be immediately removed from service until such condition(s) is corrected.
- (g) Record of tests.

At the completion of examinations and tests required under items (a), (b), and (c) of this section, the person conducting such 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 Secretary and representatives of miners.

11. High-voltage insulating gloves must:

- (a) Have a voltage rating of at least Class 1 (7500- volts) that meets or exceeds ASTM F496-02a, "Standard Specification for In-Service Care of Insulating Gloves and Sleeves" (2002);
- (b) Be air tested (rubber gloves only) at the beginning of each shift to ensure their effectiveness;
- (c) Be visually examined before each use for signs of damage or defects;
- (d) Be removed from the underground area of the mine or destroyed when damaged or defective; and,

- (e) Be electrically tested every 30 days in accordance with publication ASTM F496-02a.
12. Trammng continuous mining machines into and out of the mine, and from section to section.
- (a) When trammng the continuous mining machine into and out of the mine, and from section to section, one of the power sources specified in item (c) of this section must be used. Additionally, the following requirements apply:
    - (1) Trammng must not occur in areas where permissible equipment is required;
    - (2) The continuous mining machine must not be used for mining or cutting purposes;
    - (3) Low-, medium-, or high-voltage cables must comply with 30 CFR 75.600-1, 75.907, and 75.826, respectively;
    - (4) The energized high-voltage cable must be mechanically secured on-board the continuous mining machine. This provision applies only to Paragraphs (c)(3), (c)(4), and (c)(5) of this section.
  - (b) Prior to moving the continuous mining machine
    - (1) the power sources specified in Paragraph (c) of this section must pass a functional test of the ground-fault and ground-wire monitor circuits. The tests must be performed by a qualified electrician who meets the requirements of 30 CFR 75.153. A record of each test must be maintained and made available to authorized representatives of the Secretary and representatives of the miners; and
    - (2) the test circuit for the grounded-phase detection circuit on the continuous mining machine, if applicable, must be activated to ensure a grounded-phase condition does not exist.
  - (c) The following alternative sources of electrical power may be utilized to energize the tram motors, essential hydraulic systems and machine controls for the purpose of trammng the continuous miner into, out of or around the mine if they meet the requirements set forth below:

- (1) Portable transformer that supplies power to the 995-volt tramming motors may be used when the traction transformer and the control transformer on the continuous miner are reconnected to operate at 995-volts. The control circuit must not be used to back-feed the 2400-volt circuits on the continuous miner. The portable transformer shall not operate 2400-volt motors. When used, the portable transformer shall provide all of the electrical protective features and devices required of a section power center. The portable transformer used to power the continuous miner for tramming must not be moved when energized; or
  - (2) A temporary onboard transformer that steps up the voltage to 2400-volts may be used when the temporary onboard transformer meets the requirements specified above in Nos. 1 through 4, 10 through 13, 21 through 28, 30 and 31. The temporary transformer must comply with the following:
    - (i) The input trailing cable to the transformer must supply either low or medium voltage and comply with the applicable sections of 30 CFR 75;
    - (ii) The transformer enclosure must be connected to the incoming ground-wire of the low-or medium-voltage trailing cable and be bonded to the frame of the continuous mining machine by a No. 1/0 or larger A.W.G. grounding conductor. The metallic shell of the cable coupler must be grounded to the frame of the continuous mining machine;
    - (iii) The transformer must be securely mounted onboard the continuous mining machine and installed to minimize vibration; and
    - (iv) Be equipped with cover switches and an emergency stop switch to remove input power.
13. All electrical protective equipment used to handle energized high-voltage trailing cables shall be provided by the mine operator.
14. The petitioner's alternative method shall not be implemented until all personnel who perform maintenance on the high-voltage continuous miner system have received training in high-voltage safety, testing and maintenance procedures. Also, all personnel who work in proximity of the high-

voltage equipment or who move high-voltage equipment or cables shall be trained in high-voltage safety procedures.

The training shall be "hands on" specific, and shall be incorporated into the Part 48 training plan and in the annual refresher training plan for the mine. A record of this training shall be maintained and made available to authorized MSHA representatives and to other interested parties.

15. The high-voltage continuous mining system shall not be put into service until after MSHA has inspected the equipment and determined that it is in compliance with all the above terms and conditions.
16. Within 60 days after this Proposed Decision and Order becomes final, the Petitioner shall submit proposed revisions for its approved 30 CFR Part 48 Training Plan to the Coal Mine Safety and Health District Manager. These proposed revisions shall include, but are not limited to, task training, hazard training, specialized training for qualified persons under 30 CFR 75.153, and annual refresher training. In addition the following shall be adopted:
  - (a) Safety precautions for the handling and use of high-voltage trailing cables, for all miners assigned to work in the area of the high-voltage trailing cable; and
  - (b) Specialized training for qualified electricians that will be required to repair, maintain and/or troubleshoot the high-voltage trailing cable or equipment. This training shall focus on the requirements of this modification.

Any party to this action desiring a hearing on this matter must file in accordance with 30 CFR 44.14, within 30 days. The request for hearing must be filed with the Administrator for Coal Mine Safety and Health, 1100 Wilson Boulevard, Arlington, Virginia 22209-3939. If a hearing is requested, the request shall contain a concise summary of position on the issues of fact or law desired to be raised by the party requesting the hearing, including specific objections to the proposed decision. A party other than Petitioner who has requested a hearing shall also comment upon all issues of fact or law presented in the petition, and any party to this action requesting a hearing may indicate a desired hearing site.

If no request for a hearing is filed within 30 days after service thereof, the Decision and Order will become final and must be posted by the operator on the mine bulletin board at the mine. When this Decision and order becomes final it will supercede and fully replace the modification granted under Docket No. M-2003-023-C, issued September 3, 2003.

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Deputy Administrator  
for Coal Mine Safety and Health