



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL  
PROTECTION

# Chapter 208. Underground Coal Mine Safety

## REFERENCE GUIDE

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**A Supplemental reference document for Title 25.  
Chapter 208. Underground Coal Mine Safety**

**§ 208.1. Definitions.**

**GENERAL PROVISIONS** The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

*AED—Automated external defibrillator*—A portable device that uses electric shock to restore a stable heart rhythm to an individual in cardiac arrest.

*Act*—*The Bituminous Coal Mine Safety Act (52 P.S. §§ 690-101—690-708).*

*Approval or approved*—The term as defined in section 104 of the act (52 P.S. § 690-104).

*Barricaded*—To obstruct passage of persons, vehicles or flying materials.

*Berm*—A pile or mound of material capable of restraining a vehicle.

*Certified or registered*—A person certified or registered by the state in which the coal mine is located to perform duties prescribed by 30 CFR Part 77 (relating to mandatory safety standards, surface coal mines, and surface work areas of underground coal mines), except that, in a state where a program of certification or registration is not provided or when the program does not meet at least minimum Federal standards established by the Secretary of the United States Department of Labor, the certification or registration shall be by the Secretary of the United States Department of Labor.

*Crosscut*—A passageway driven between the entry and its parallel air course or air courses for ventilation purposes.

*Flash point*—The minimum temperature at which sufficient vapor is released by a liquid or solid to form a flammable vapor-air mixture at atmospheric pressure.

*Inby*—In the direction of the working face.

*MSHA*—The term as defined in section 104 of the act.

*Miner*—The term as defined in section 104 of the act.

*NIOSH*—The term as defined in section 104 of the act.

*Operator*—The term as defined in section 104 of the act.

*Overpressure*—The pressure over the background atmospheric pressure that could result from an explosion, which includes the impact of the pressure wave on an object.

*psi*—Pounds per square inch.

*Qualified person*—The term means either of the following as determined by the context of the regulation:

(i) An individual deemed qualified by the Secretary of the United States Department of Labor and designated by the operator to make tests and examinations required under 30 CFR Part 77.

(ii) An individual deemed, in accordance with the minimum requirements to be established by the Secretary of the United States Department of Labor, qualified by training, education, and experience to perform electrical work, to maintain electrical equipment, and to conduct examinations, and make tests of all electrical equipment.

*Representative of the miners*—The term as defined in section 104 of the act.

*Roll protection*—A framework, safety canopy or similar protection for the operator when equipment overturns.

*SCSR—Self-contained self-rescue device*—A type of closed-circuit, self-contained breathing apparatus approved by MSHA and NIOSH under 42 CFR Part 84 (relating to approval of respiratory protective devices) for escape only from underground mines.

*Safety can*—An approved container, of not over five gallons capacity, having a spring-closing lid and spout cover.

*Trailing cable*—The cable connecting portable and mobile equipment to a power source. A cable is not considered a trailing cable if it connects to equipment which is installed in a stationary location and is permanently wired.

*Underground bituminous coal mine or mine*—The term as defined in section 104 of the act.

*Working face*—Any place in a mine where coal is extracted during a mining cycle.

*Working section*—The area in a mine from the face extending back 1,000 feet.

## **§ 208.2. Scope.**

The safety standards and procedures in this chapter apply to all underground bituminous coal mines, operators, and miners subject to the act.

### **§ 208.3. Access to material.**

Upon request from the Department, or as required under this chapter, an operator shall submit to the Department a copy of any application, report, plan, or other material submitted to MSHA pursuant to a regulation adopted by reference in this chapter. Upon request from the authorized representative of the miners, the Department will provide to the representative of the miners copies of an application, report, plan, or other material submitted by an operator to MSHA pursuant to a regulation adopted by reference in this chapter.

## **SEALS**

### **§ 208.11. Seals.**

(a) *Seal installation.* The provisions of 30 CFR 75.335(c) (relating to seal strengths, design applications, and installation) are incorporated by reference.

(b) *Seal Strength greater than 120 psi.* The provisions of 30 CFR 75.335(a)(3) shall be used for determining when the strength of a seal shall exceed 120 psi.

(c) *Seal installation approval.* The operator shall submit an application to install the MSHA-approved seal design to the Department for its review and approval concerning seal installation. An approved application to install the seal shall be made part of the abandoned area ventilation plan required under section 235 of the act (52 P. S. § 690-235) regarding unused and abandoned parts of mines and follow 30 CFR 75.335(c).

(1) The operator shall provide the representative of the miners, if applicable, the approved seal design installation application at the same time the operator submits the application to the Department.

(2) Any individual installing the seal shall do so in accordance with the approved abandoned area ventilation plan.

### **§ 75.335 (c) installation.**

(c) *Seal installation approval.* The installation of the approved seal design shall be subject to approval in the ventilation plan. The mine operator shall—

(1) Retain the seal design approval and installation information for as long as the seal is needed to serve the purpose for which it was built.

(2) Designate a professional engineer to conduct or have oversight of seal installation and certify that the provisions in the approved seal design specified in this section have been addressed and are applicable to conditions at the mine. A copy of the certification shall be submitted to the District Manager with the information provided in paragraph (c)(3)

of this section and a copy of the certification shall be retained for as long as the seal is needed to serve the purpose for which it was built.

(3) Provide the following information for approval in the ventilation plan—

- (i) The MSHA Technical Support Approval Number;
- (ii) A summary of the installation procedures;
- (iii) The mine map of the area to be sealed and proposed seal locations that include the deepest points of penetration prior to sealing. The mine map shall be certified by a professional engineer or a professional land surveyor.
- (iv) Specific mine site information, including—
  - (A) Type of seal;
  - (B) Safety precautions taken prior to seal achieving design strength;
  - (C) Methods to address site-specific conditions that may affect the strength and applicability of the seal including set-back distances;
  - (D) Site preparation;
  - (E) Sequence of seal installations;
  - (F) Projected date of completion of each set of seals;
  - (G) Supplemental roof support inby and outby each seal;
  - (H) Water flow estimation and dimensions of the water drainage system through the seals;
  - (I) Methods to ventilate the outby face of seals once completed;
  - (J) Methods and materials used to maintain each type of seal;
  - (K) Methods to address shafts and boreholes in the sealed area;
  - (L) Assessment of potential for overpressures greater than 120 psi in sealed area;
  - (M) Additional sampling locations; and
  - (N) Additional information required by the District Manager.

**§ 75.335 (a)(3) Seal strength.**

(a) ***Seal strengths.*** Seals constructed on or after October 20, 2008 shall be designed, constructed, and maintained to withstand—

(3) Overpressures greater than 120 psi if the atmosphere in the sealed area is not monitored and is not maintained inert, and

- (i) The atmosphere in the sealed area is likely to contain homogeneous mixtures of methane between 4.5 percent

and 17.0 percent and oxygen exceeding 17.0 percent throughout the entire area;

(ii) Pressure piling could result in overpressures greater than 120 psi in the area to be sealed; or

(iii) Other conditions are encountered, such as the likelihood of a detonation in the area to be sealed.

(iv) Where the conditions in paragraphs (a)(3)(i), (ii), or (iii) of this section are encountered, the mine operator shall revise the ventilation plan to address the potential hazards. The plan shall include seal strengths sufficient to address such conditions.

#### **§ 208.12. Sampling and monitoring requirements.**

The provisions of 30 CFR 75.336 (relating to sampling and monitoring requirements) are incorporated by reference.

#### **§ 75.336 Sampling and monitoring requirements.**

(a) A certified person as defined in § 75.100 shall monitor atmospheres of sealed areas. Sealed areas shall be monitored, whether ingassing or outgassing, for methane and oxygen concentrations and the direction of leakage.

(1) Each sampling pipe and approved sampling location shall be sampled at least every 24 hours.

(i) Atmospheres with seals of 120 psi or greater shall be sampled until the design strength is reached for every seal used to seal the area.

(ii) Atmospheres with seals less than 120 psi constructed before October 20, 2008 shall be monitored for methane and oxygen concentrations and maintained inert. The operator may request that the District Manager approve different sampling locations and frequencies in the ventilation plan, provided at least one sample is taken at each set of seals at least every seven days.

(iii) Atmospheres with seals less than 120 psi constructed after October 20, 2008 shall be monitored for methane and oxygen concentrations and maintained inert. The operator may request that the District Manager approve different sampling locations and frequencies in the ventilation plan after a minimum of 14 days and after the seal design strength is reached, provided at least one sample is taken at each set of seals at least every seven days.

(2) The mine operator shall evaluate the atmosphere in the sealed area to determine whether sampling through the sampling pipes in seals and approved locations provides appropriate sampling locations of the sealed area. The mine operator shall make the evaluation immediately after the minimum 14-day required sampling, if the mine ventilation system is reconfigured, if changes occur that adversely

affect the sealed area, or if the District Manager requests an evaluation. When the results of the evaluations indicate the need for additional sampling locations, the mine operator shall provide the additional locations and have them approved in the ventilation plan. The District Manager may require additional sampling locations and frequencies in the ventilation plan.

(3) Mine operators with an approved ventilation plan addressing spontaneous combustion pursuant to § 75.334(f) shall sample the sealed atmosphere in accordance with the ventilation plan.

(4) The District Manager may approve in the ventilation plan the use of a continuous monitoring system in lieu of monitoring provisions in this section.

(b)

(1) Except as provided in § 75.336(d), the atmosphere in the sealed area is considered inert when the oxygen concentration is less than 10.0 percent or the methane concentration is less than 3.0 percent or greater than 20.0 percent.

(2) Immediate action shall be taken by the mine operator to restore an inert sealed atmosphere behind seals with strengths less than 120 psi. Until the atmosphere in the sealed area is restored to an inert condition, the sealed atmosphere shall be monitored at each sampling pipe and approved location at least once every 24 hours.

(c) Except as provided in § 75.336(d), when a sample is taken from the sealed atmosphere with seals of less than 120 psi and the sample indicates that the oxygen concentration is 10 percent or greater and methane is between 4.5 percent and 17 percent, the mine operator shall immediately take an additional sample and then immediately notify the District Manager. When the additional sample indicates that the oxygen concentration is 10 percent or greater and methane is between 4.5 percent and 17 percent, persons shall be withdrawn from the affected area which is the entire mine or other affected area identified by the operator and approved by the District Manager in the ventilation plan, except those persons referred to in § 104(c) of the Act. The operator may identify areas in the ventilation plan to be approved by the District Manager where persons may be exempted from withdrawal. The operator's request shall address the location of seals in relation to: Areas where persons work and travel in the mine; escapeways and potential for damage to the escapeways; and ventilation systems and controls in areas where persons work or travel and where ventilation is used for escapeways. The operator's request shall also address the gas concentration of other sampling locations in the sealed area and other required information. Before miners reenter the mine, the mine operator

shall have a ventilation plan revision approved by the District Manager specifying the actions to be taken.

(d) In sealed areas with a demonstrated history of carbon dioxide or sealed areas where inert gases have been injected, the operator may request that the District Manager approve in the ventilation plan an alternative method to determine if the sealed atmosphere is inert and when miners have to be withdrawn. The mine operator shall address in the ventilation plan the specific levels of methane, carbon dioxide, nitrogen and oxygen; the sampling methods and equipment used; and the methods to evaluate these concentrations underground at the seal.

(e) ***Recordkeeping.***

(1) The certified person shall promptly record each sampling result including the location of the sampling points, whether ingassing or outgassing, and oxygen and methane concentrations. The results of oxygen and methane samples shall be recorded as the percentage of oxygen and methane measured by the certified person and any hazardous condition found in accordance with § 75.363.

(2) The mine operator shall retain sampling records at the mine for at least one year from the date of the sampling.

**§ 208.13. Construction and repair of seals.**

(a) *General.* The provisions of 30 CFR 75.337 (relating to construction and repair of seals) are incorporated by reference.

(b) *Welding, cutting and soldering.* The operator shall submit to the Department and the representative of the miners the same information submitted to MSHA under 30 CFR 75.337(f). Any welding, cutting or soldering within 150 feet of a seal shall be performed in accordance with the MSHA approval.

**§ 75.337 Construction and repair of seals.**

(a) The mine operator shall maintain and repair seals to protect miners from hazards of sealed areas.

(b) Prior to sealing, the mine operator shall -

(1) Remove insulated cables, batteries, and other potential electric ignition sources from the area to be sealed when constructing seals, unless it is not safe to do so. If ignition sources cannot safely be removed, seals must be constructed to at least 120 psi;

(2) Remove metallic objects through or across seals; and

(3) Breach or remove all stoppings in the first crosscut in by the seals immediately prior to sealing the area.

(c) A certified person designated by the mine operator shall directly supervise seal construction and repair and -

(1) Examine each seal site immediately prior to construction or repair to ensure that the site is in accordance with the approved ventilation plan;



- (2) Examine each seal under construction or repair during each shift to ensure that the seal is being constructed or repaired in accordance with the approved ventilation plan;
  - (3) Examine each seal upon completion of construction or repair to ensure that construction or repair is in accordance with the approved ventilation plan;
  - (4) Certify by initials, date, and time that the examinations were made; and
  - (5) Make a record of the examination at the completion of any shift during which an examination was conducted. The record shall include each deficiency and the corrective action taken. The record shall be countersigned by the mine foreman or equivalent mine official by the end of the mine foreman's or equivalent mine official's next regularly scheduled working shift. The record shall be kept at the mine for one year.
- (d) Upon completion of construction of each seal a senior mine management official, such as a mine manager or superintendent, shall certify that the construction, installation, and materials used were in accordance with the approved ventilation plan. The mine operator shall retain the certification for as long as the seal is needed to serve the purpose for which it was built.
- (e) The mine operator shall -
- (1) Notify the District Manager between two and fourteen days prior to commencement of seal construction;
  - (2) Notify the District Manager, in writing, within five days of completion of a set of seals and provide a copy of the certification required in paragraph (d) of this section; and
  - (3) Submit a copy of quality control results to the District Manager for seal material properties specified by § 75.335 within 30 days of completion of quality control tests.
- (f) ***Welding, cutting, and soldering.*** Welding, cutting, and soldering with an arc or flame are prohibited within 150 feet of a seal. An operator may request a different location in the ventilation plan to be approved by the District Manager. The operator's request must address methods the mine operator will use to continuously monitor atmospheric conditions in the sealed area during welding or burning; the airflow conditions in and around the work area; the rock dust and water application methods; the availability of fire extinguishers on hand; the procedures to maintain safe conditions, and other relevant factors.
- (g) ***Sampling pipes.***
- (1) For seals constructed after April 18, 2008, one non-metallic sampling pipe shall be installed in each seal that shall extend into the center of the first connecting crosscut in by the seal. If an open crosscut does not exist,

the sampling pipe shall extend one-half of the distance of the open entry in by the seal.

(2) Each sampling pipe shall be equipped with a shut-off valve and appropriate fittings for taking gas samples.

(3) The sampling pipes shall be labeled to indicate the location of the sampling point when more than one sampling pipe is installed through a seal.

(4) If a new seal is constructed to replace or reinforce an existing seal with a sampling pipe, the sampling pipe in the existing seal shall extend through the new seal. An additional sampling pipe shall be installed through each new seal to sample the area between seals, as specified in the approved ventilation plan.

(h) **Water drainage system.** For each set of seals constructed after April 18, 2008, the seal at the lowest elevation shall have a corrosion-resistant, non-metallic water drainage system. Seals shall not impound water or slurry. Water or slurry shall not accumulate within the sealed area to any depth that can adversely affect a seal.

#### **§ 208.14. Training.**

The provisions of 30 CFR 75.338 (relating to training) are incorporated by reference.

#### **§ 75.338 Training.**

(a) Certified persons conducting sampling shall be trained in the use of appropriate sampling equipment, procedures, location of sampling points, frequency of sampling, size and condition of the sealed area, and the use of continuous monitoring systems if applicable before they conduct sampling, and annually thereafter. The mine operator shall certify the date of training provided to certified persons and retain each certification for two years.

(b) Miners constructing or repairing seals, designated certified persons, and senior mine management officials shall be trained prior to constructing or repairing a seal and annually thereafter. The training shall address materials and procedures in the approved seal design and ventilation plan. The mine operator shall certify the date of training provided each miner, certified person, and senior mine management official and retain each certification for two years.

#### **§ 208.15. Seals records.**

(a) *General.* The provisions of 30 CFR 75.339 (relating to seals records) are incorporated by reference.

(b) *Access to records.* Upon request from the Department, or from the authorized representative of the miners, mine operators shall provide access to any record required by this section.

**§ 75.339 Seals records.**

<b>Record</b>	<b>Section reference</b>	<b>Retention time</b>
(1) Approved seal design	75.335(c)(1)	As long as the seal is needed to serve the purpose for which it is built.
(2) Certification of Provisions of Approved Seal Design is Addressed	75.335(c)(2)	As long as the seal is needed to serve the purpose for which it is built.
(3) Gas sampling records	75.336(e)(2)	One year.
(4) Record of examinations	75.337(c)(5)	One year.
(5) Certification of seal construction, installation, and materials	75.337(d)	As long as the seal is needed to serve the purpose for which it is built.
(6) Certification of Training for Persons that Sample	75.338(a)	Two years.
(7) Certification of Training for Persons that Perform Seal Construction and Repair	75.338(b)	Two years.

(a) The table entitled “Seal Recordkeeping Requirements” lists records the operator shall maintain and the retention period for each record.

**Table - § 75.339(a) Seal Recordkeeping Requirements**

(b) Records required by §§ 75.335, 75.336, 75.337 and 75.338 shall be retained at a surface location at the mine in a secure book that is not susceptible to alteration. The records may be retained electronically in a computer system that is secure and not susceptible to alteration, if the mine operator can immediately access the record from the mine site.

(c) Upon request from an authorized representative of the Secretary of Labor, the Secretary of Health and Human Services, or from the authorized representative of miners, mine operators shall promptly provide access to any record listed in the table in this section.

(d) Whenever an operator ceases to do business or transfers control of the mine to another entity, that operator shall transfer all records required to be maintained by this part, or a copy thereof, to any successor operator who shall maintain them for the required period.

## ESCAPEWAYS

### § 208.21. Escapeways.

(a) *Bituminous and lignite mines.* The provisions of 30 CFR 75.380 (relating to escapeways; bituminous and lignite mines) are incorporated by reference except that the language in 30 CFR 75.380(c) allowing the two escapeways to end in one multiple compartment shaft or slope separated by walls is not incorporated by reference.

(b) *Mechanical and escape facilities.* The provisions of 30 CFR 75.382 (relating to mechanical escape facilities) are incorporated by reference.

(c) *Longwall and shortwall travelways.* The provisions of 30 CFR 75.384 (relating to longwall and shortwall travelways) are incorporated by reference. If a roof fall or other blockage occurs that prevents travel in the travelway, the mine operator shall notify the Department.

### § 75.380 Escapeways; bituminous and lignite mines.

(a) Except in situations addressed in § 75.381, § 75.385 and § 75.386, at least two separate and distinct travelable passageways shall be designated as escapeways and shall meet the requirements of this section.

(b)

(1) Escapeways shall be provided from each working section, and each area where mechanized mining equipment is being installed or removed, continuous to the surface escape drift opening or continuous to the escape shaft or slope facilities to the surface.

(2) During equipment installation, these escapeways shall begin at the projected location for the section loading point. During equipment removal, they shall begin at the location of the last loading point.

(d) Each escapeway shall be—

(1) Maintained in a safe condition to always assure passage of anyone, including disabled persons;

(2) Clearly marked to show the route and direction of travel to the surface;

(3) Maintained to at least a height of five feet from the mine floor to the mine roof, excluding the thickness of any roof support, except that the escapeways shall be maintained to at least the height of the coalbed, excluding the thickness of any roof support, where the coalbed is less than five feet. In areas of mines where escapeways pass through doors, the height may be less than five feet, provided that sufficient height is maintained to enable miners, including disabled persons, to escape quickly in an emergency. In areas of mines developed before November 16, 1992,

where escapeways pass over or under overcasts or undercasts, the height may be less than five feet provided that sufficient height is maintained to enable miners, including disabled persons, to escape quickly in an emergency. When there is a need to determine whether sufficient height is provided, MSHA may require a stretcher test where four persons carry a miner through the area in question on a stretcher;

(4) Maintained at least six feet wide except—

(i) Where necessary supplemental roof support is installed, the escapeway shall not be less than four feet wide; or

(ii) Where the route of travel passes through doors or other permanent ventilation controls, the escapeway shall be at least four feet wide to enable miners to escape quickly in an emergency, or

(iii) Where the alternate escapeway passes through doors or other permanent ventilation controls or where supplemental roof support is required and sufficient width is maintained to enable miners, including disabled persons, to escape quickly in an emergency. When there is a need to determine whether sufficient width is provided, MSHA may require a stretcher test where four persons carry a miner through the area in question on a stretcher, or

(iv) Where mobile equipment near working sections, and other equipment essential to the ongoing operation of longwall sections, is necessary during normal mining operations, such as material cars containing rock dust or roof control supplies, or is to be used for the evacuation of miners off the section in the event of an emergency. In any instance, escapeways shall be of sufficient width to enable miners, including disabled persons, to escape quickly in an emergency. When there is a need to determine whether sufficient width is provided, MSHA may require a stretcher test where four persons carry a miner through the area in question on a stretcher;

(5) Located to follow the most direct, safe and practical route to the nearest mine opening suitable for the safe evacuation of miners; and

(6) Provided with ladders, stairways, ramps, or similar facilities where the escapeways cross over obstructions.

(7) Provided with a continuous, durable directional lifeline or equivalent device that shall be—

(i) Installed and maintained throughout the entire length of each escapeway as defined in paragraph (b)(1) of this section;

- (ii) Flame-resistant in accordance with the requirements of part 18 of this chapter upon replacement of existing lifelines; but in no case later than June 15, 2009;
- (iii) Marked with a reflective material every 25 feet;
- (iv) Located in such a manner for miners to use effectively to escape;
- (v) Equipped with one directional indicator cone securely attached to the lifeline, signifying the route of escape, placed at intervals not exceeding 100 feet. Cones shall be installed so that the tapered section points inby;
- (vi) Equipped with one sphere securely attached to the lifeline at each intersection where personnel doors are installed in adjacent crosscuts;
- (vii) Equipped with two securely attached cones, installed consecutively with the tapered section pointing inby, to signify an attached branch line is immediately ahead.

(A) A branch line leading from the lifeline to an SCSR cache will be marked with four cones with the base sections in contact to form two diamond shapes. The cones must be placed within reach of the lifeline.

(B) A branch line leading from the lifeline to a refuge alternative will be marked with a rigid spiraled coil at least eight inches in length. The spiraled coil must be placed within reach of the lifeline (see Illustration 1 below).

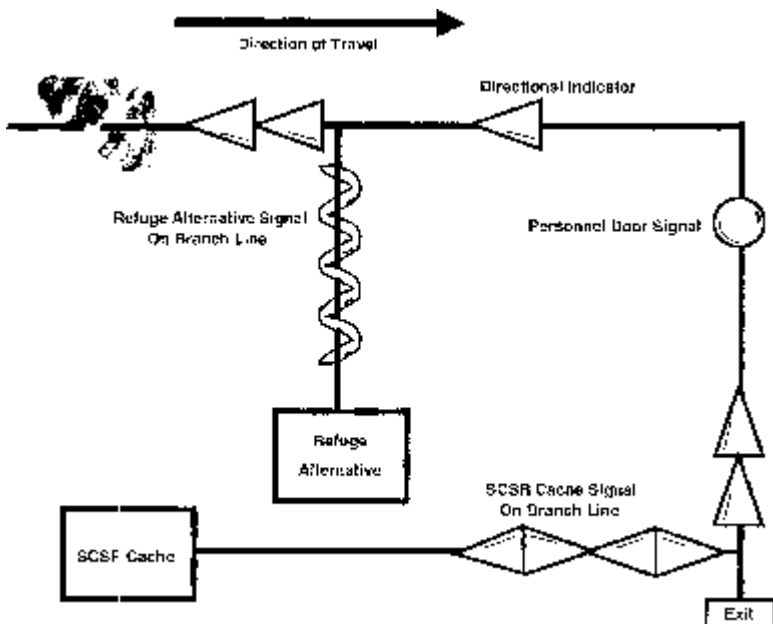


Illustration 1

(e) Surface openings shall be adequately protected to prevent surface fires, fumes, smoke, and flood water from entering the mine.

**(f) Primary escapeway.**

(1) One escapeway that is ventilated with intake air shall be designated as the primary escapeway. The primary escapeway shall have a higher ventilation pressure than the belt entry unless the mine operator submits an alternative in the mine ventilation plan to protect the integrity of the primary escapeway, based on mine specific conditions, which is approved by the district manager.

(2) Paragraphs (f)(3) through (f)(7) of this section apply as follows:

(i) To all areas of a primary escapeway developed on or after November 16, 1992;

(ii) Effective as of June 10, 1997, to all areas of a primary escapeway developed between March 30, 1970 and November 16, 1992; and

(iii) Effective as of June 10, 1997, to all areas of the primary escapeway developed prior to March 30, 1970 where separation of the belt and trolley haulage entries from the primary escapeway existed prior to November 16, 1992.

(3) The following equipment is not permitted in the primary escapeway:

(i) Mobile equipment hauling coal except for hauling coal incidental to cleanup or maintenance of the primary escapeway.

(ii) Compressors, except—

(A) Compressors necessary to maintain the escapeway in safe, travelable condition;

(B) Compressors that are components of equipment such as locomotives and rock dusting machines; and

(C) Compressors of less than five horsepower.

(iii) Underground transformer stations, battery charging stations, substations, and rectifiers except—

(A) Where necessary to maintain the escapeway in safe, travelable condition; and

(B) Battery charging stations and rectifiers and power centers with transformers that are either dry-type or contain nonflammable liquid, provided they are located on or near a working section and are moved as the section advances or retreats.

(iv) Water pumps, except—

(A) Water pumps necessary to maintain the escapeway in safe, travelable condition;

(B) Submersible pumps;

(C) Permissible pumps and associated permissible switchgear;

(D) Pumps located on or near a working section that are moved as the section advances or retreats;

(E) Pumps installed in anthracite mines; and

(F) Small portable pumps.

(4) Mobile equipment operated in the primary escapeway, except for continuous miners and as provided in paragraphs (f)(5), (f)(6), and (f)(7) of this section, shall be equipped with a fire suppression system installed according to §§ 75.1107–3 through 75.1107–16 that is—

(i) Manually operated and attended continuously by a person trained in the systems function and use, or

(ii) A multipurpose dry chemical type capable of both automatic and manual activation.

(5) Personnel carriers and small mobile equipment designed and used only for carrying people and small hand tools may be operated in primary escapeways if—

(i) The equipment is provided with a multipurpose dry chemical type fire suppression system capable of both automatic and manual activation, and the suppression system is suitable for the intended application and is listed or approved by a nationally recognized independent testing laboratory, or,

(ii) Battery powered and provided with two 10 pound multipurpose dry chemical portable fire extinguishers.

(6) Notwithstanding the requirements of paragraph (f)(3)(i), mobile equipment not provided with a fire suppression system may operate in the primary escapeway if no one is in by except those persons directly engaged in using or moving the equipment.

(7) Notwithstanding the requirements of paragraph (f)(3)(i), mobile equipment designated and used only as emergency vehicles or ambulances, may be operated in the primary escapeway without fire suppression systems.

(g) Except where separation of belt and trolley haulage entries from designated escapeways did not exist before November 15, 1992, and except as provided in § 75.350(c), the primary escapeway must be separated from belt and trolley haulage entries for its entire length, to and including the first connecting crosscut outby each loading point except when a greater or lesser distance for this separation is specified and approved in the mine ventilation plan and does not pose a hazard to miners.

(h) **Alternate escapeway.** One escapeway shall be designated as the alternate escapeway. The alternate escapeway shall be separated from the primary escapeway for its entire length, except that the alternate and primary escapeways may be ventilated from a common intake air shaft or slope opening.



(i) Mechanical escape facilities shall be provided and maintained for—

(1) Each shaft that is part of a designated escapeway and is greater than 50 feet in depth; and

(2) Each slope from the coal seam to the surface that is part of a designated escapeway and is inclined more than nine degrees from the horizontal.

(j) Within 30 minutes after mine personnel on the surface have been notified of an emergency requiring evacuation, mechanical escape facilities provided under paragraph (i) of this section shall be operational at the bottom of shaft and slope openings that are part of escapeways.

(k) Except where automatically activated hoisting equipment is used, the bottom of each shaft or slope opening that is part of a designated escapeway shall be equipped with a means of signaling a surface location where a person is always on duty when anyone is underground. When the signal is activated or the evacuation of persons underground is necessary, the person shall assure that mechanical escape facilities are operational as required by paragraph (j) of this section.

(l)

(1) Stairways or mechanical escape facilities shall be installed in shafts that are part of the designated escapeways and that are 50 feet or less in depth, except ladders may be used in shafts that are part of the designated escapeways and that are five feet or less in depth.

(2) Stairways shall be constructed of concrete or metal, set on an angle not to exceed 45 degrees from the horizontal, and equipped on the open side with handrails. In addition, landing platforms that are at least two feet by four feet shall be installed at intervals not to exceed 20 vertical feet on the stairways and equipped on the open side with handrails.

(3) Ladders shall be constructed of metal, anchored securely, and set on an angle not to exceed 60 degrees from the horizontal.

(m) A travelway designed to prevent slippage shall be provided in slope and drift openings that are part of designated escapeways, unless mechanical escape facilities are installed.

#### **§ 75.382 Mechanical escape facilities.**

(a) Mechanical escape facilities shall be provided with overspeed, overwind, and automatic stop controls.

(b) Every mechanical escape facility with a platform, cage, or other device shall be equipped with brakes that can stop the fully loaded platform, cage, or other device.

(c) Mechanical escape facilities, including automatic elevators, shall be examined weekly. The weekly examination of this equipment may be conducted at the same time as a daily examination required by § 75.1400-3.

(1) The weekly examination shall include an examination of the headgear, connections, links, and chains, overspeed

and overwind controls, automatic stop controls, and other facilities.

(2) At least once each week, the hoist shall be run through one complete cycle of operation to determine that it is operating properly.

(d) A person trained to operate the mechanical escape facility always shall be available while anyone is underground to provide the mechanical escape facilities, if required, to the bottom of each shaft and slope opening that is part of an escapeway within 30 minutes after personnel on the surface have been notified of an emergency requiring evacuation. However, no operator is required for automatically operated cages, platforms, or elevators.

(e) Mechanical escape facilities shall have rated capacities consistent with the loads handled.

(f) Manually-operated mechanical escape facilities shall be equipped with indicators that accurately and reliably show the position of the facility.

(g) **Certification.** The person making the examination as required by paragraph (c) of this section shall certify by initials, date, and the time that the examination was made. Certifications shall be made at or near the facility examined.

#### **§ 75.384 Longwall and shortwall travelways.**

(a) If longwall or shortwall mining systems are used and the two designated escapeways required by § 75.380 are located on the headgate side of the longwall or shortwall, a travelway shall be provided on the tailgate side of that longwall or shortwall. The travelway shall be located to follow the most direct and safe practical route to a designated escapeway.

(b) The route of travel shall be clearly marked.

(c) When a roof fall or other blockage occurs that prevents travel in the travelway—

(1) Work shall cease on the longwall or shortwall face;

(2) Miners shall be withdrawn from face areas to a safe area outby the section loading point; and

(3) MSHA shall be notified.

(d) Work may resume on the longwall or shortwall face after the procedures set out in §§ 75.215 and 75.222 are implemented.

### **BELTS**

#### **§ 208.31. Approval of conveyor belts.**

The provisions of 30 CFR 75.1108(b) and (c) (relating to approved conveyor belts) are incorporated by reference.

#### **§ 75.1108 Approved conveyor belts.**

(b) Effective December 31, 2009 conveyor belts placed in service in underground coal mines shall be approved under Part 14. If MSHA determines that Part 14 approved belt is not available, the Agency will consider an extension of the effective date.

(c) Effective December 31, 2018 all conveyor belts used in underground coal mines shall be approved under Part 14.

**§ 208.32. Maintenance of belt conveyors and belt conveyor entries.**

(a) *Maintenance standards.* The provisions of 30 CFR 75.1731 (relating to maintenance of belt conveyors and belt conveyor entries) are incorporated by reference.

(b) *Inspections.* Individuals conducting inspections of belt conveyors required under sections 218 and 218.1 of the act (52 P. S. §§ 690-218 and 690-218.1) regarding preshift examination at fixed intervals and supplemental inspection shall address compliance with this section's maintenance requirements.

**§ 75.1731 Maintenance of belt conveyors and belt conveyor entries.**

(a) Damaged rollers, or other damaged belt conveyor components, which pose a fire hazard must be immediately repaired or replaced. All other damaged rollers, or other damaged belt conveyor components, must be repaired or replaced.

(b) Conveyor belts must be properly aligned to prevent the moving belt from rubbing against the structure or components.

(c) Materials shall not be allowed in the belt conveyor entry where the material may contribute to a frictional heating hazard.

(d) Splicing of any approved conveyor belt must maintain flame-resistant properties of the belt.

**EMERGENCIES**

**§ 208.41. Emergency evacuation.**

(a) *Emergency evacuation.* The provisions of 30 CFR 75.1501 (relating to emergency evacuations) are incorporated by reference.

(b) *Individual located on the surface.* An individual designated by the mine operator who is adequately trained and is capable of initiating the emergency response plan shall be located on the surface in the event the designated responsible person is not available.

**§ 75.1501 Emergency evacuations.**

(a) For each shift that miners work underground, there shall be in attendance a responsible person designated by the mine operator to take charge during mine emergencies involving a fire, explosion, or gas or water inundation.

(1) The responsible person shall have current knowledge of the assigned location and expected movements of miners underground, the operation of the mine ventilation system, the locations of the mine escapeways and refuge alternatives, the mine communications system, any mine

monitoring system if used, locations of firefighting equipment, the mine's Emergency Response Plan, the Mine Rescue Notification Plan, and the Mine Emergency Evacuation and Firefighting Program of Instruction.

(2) The responsible person shall be trained annually in a course of instruction in mine emergency response, as prescribed by MSHA's Office of Educational Policy and Development. The course will include topics such as the following:

- (i) Organizing a command center;
- (ii) Coordinating firefighting personnel;
- (iii) Deploying firefighting equipment;
- (iv) Coordinating mine rescue personnel;
- (v) Establishing fresh air base;
- (vi) Deploying mine rescue teams;
- (vii) Providing for mine gas sampling and analysis;
- (viii) Establishing security;
- (ix) Initiating an emergency mine evacuation;
- (x) Contacting emergency personnel; and
- (xi) Communicating appropriate information related to the emergency.

(3) The operator shall certify by signature and date after each responsible person has completed the training and keep the certification at the mine for one year.

(b) The responsible person shall initiate and conduct an immediate mine evacuation when there is a mine emergency which presents an imminent danger to miners due to fire or explosion or gas or water inundation. Only properly trained and equipped persons essential to respond to the mine emergency may remain underground.

(c) The mine operator shall instruct all miners of the identity of the responsible person designated by the operator for their workshift. The mine operator shall instruct miners of any change in the identity of the responsible person before the start of their workshift.

(d) Nothing in this section shall be construed to restrict the ability of other persons in the mine to warn of an imminent danger which warrants evacuation.

**§ 208.42. Emergency evacuation and firefighting program of instruction.**

The provisions of 30 CFR 75.1502 (relating to mine emergency evacuation and firefighting program of instruction) are incorporated by reference.

**§ 75.1502 Mine emergency evacuation and firefighting program of instruction.**

Each operator of an underground coal mine shall adopt and follow a mine emergency evacuation and firefighting program that instructs all miners in the proper procedures they must follow if a mine emergency occurs.

(a) **Program approval.** The operator shall submit this program of instruction, and any revisions, for approval to the District Manager of the Coal Mine Safety and Health district in which the mine is located. Within 30 days of approval, the operator shall conduct training in accordance with the revised program.

(b) **New or revised provisions.** Before implementing any new or revised approved provision in the program of instruction, the operator shall instruct miners in the change.

(c) **Instruction plan.** The approved program shall include a specific plan designed to instruct miners on all shifts on the following:

(1) Procedures for—

(i) Evacuating the mine for mine emergencies that present an imminent danger to miners due to fire, explosion, or gas or water inundation;

(ii) Evacuating all miners not required for a mine emergency response; and

(iii) The rapid assembly and transportation of necessary miners, fire suppression equipment, and rescue apparatus to the scene of the mine emergency.

(2) The use, care, and maintenance of self-rescue devices, including hands-on training in the complete donning and transferring of all types of self-rescue devices used at the mine.

(3) The deployment, use, and maintenance of refuge alternatives.

(4) Scenarios requiring a discussion of options and a decision as to the best option for evacuation under each of the various mine emergencies (fires, explosions, or gas or water inundations). These options shall include:

(i) Encountering conditions in the mine or circumstances that require immediate donning of self-rescue devices.

(ii) Using continuous directional lifelines or equivalent devices, tethers, and doors;

(iii) Traversing undercasts or overcasts;

(iv) Switching escapeways, as applicable;

(v) Negotiating any other unique escapeway conditions; and

(vi) Using refuge alternatives.

(5) Location and use of the fire suppression and firefighting equipment and materials available in the mine.

(6) Location of the escapeways, exits, routes of travel to the surface, including the location of continuous directional lifelines or equivalent devices.

(7) Location, quantity, types, and use of stored SCSRs, as applicable.

(8) A review of the mine map; the escapeway system; the escape, firefighting, and emergency evacuation plan in effect at the mine; and the locations of refuge alternatives and abandoned areas.

(9) A description of how miners will receive annual expectations training that includes practical experience in donning and transferring SCSRs in smoke, simulated smoke, or an equivalent environment and breathing through a realistic SCSR training unit or device that provides the sensation of SCSR airflow resistance and heat.

(10) A summary of the procedures related to deploying refuge alternatives.

(11) A summary of the construction methods for 15 psi stoppings constructed prior to an event.

(12) A summary of the procedures related to refuge alternative use.

**(d) Instructors.**

(1) The mine operator shall designate a person who has the ability, training, knowledge, or experience to conduct the mine emergency evacuation instruction and drills in his or her area of expertise.

(2) Persons conducting SCSR donning and transferring training shall be able to effectively train and evaluate whether miners can successfully don the SCSR and transfer to additional SCSR devices.

**§ 208.43. Use of fire suppression equipment.**

The provisions of 30 CFR 75.1503 (relating to use of fire suppression equipment) are incorporated by reference.

**§ 75.1503 Use of fire suppression equipment.**

In addition to the approved program of instruction required by 30 CFR 75.1502, each operator of an underground coal mine shall ensure the following.

(a) **Working section.** At least two miners in each working section on each production shift shall be proficient in the use of all fire suppression equipment available on such working section, and know the location of such fire suppression equipment.

(b) **Attended equipment.** Each operator of attended equipment specified in 30 CFR 75.1107-1(c)(1), and each miner assigned to perform job duties at the job site in the direct line of sight of attended equipment as described in 30 CFR 75.1107-1(c)(2), shall be proficient in the use of fire suppression devices installed on such attended equipment.

(c) **Maintenance shift.** The shift foreman and at least one miner for every five miners working underground on a maintenance shift shall be proficient in the use of fire suppression equipment available in the mine, and know the location of such fire suppression equipment.

**§ 208.44. Mine emergency evacuation training and drills.**

The provisions of 30 CFR 75.1504 (relating to mine emergency evacuation training and drills) are incorporated by reference.

**§ 75.1504 Mine emergency evacuation training and drills.**

Each operator of an underground coal mine shall conduct mine emergency evacuation training and drills and require all miners to participate.

(a) **Schedule of training and drills.** Each miner shall participate in a mine emergency evacuation training and drill once each quarter. Quarters shall be based on a calendar year (Jan–Mar, Apr–Jun, Jul–Sep, Oct–Dec). In addition—

(1) A newly hired miner, who has not participated in a mine emergency evacuation training and drill at the mine within the previous three months, shall participate in the next applicable mine emergency evacuation training and drill.

(2) Prior to assuming duties on a section or outby work location, a foreman shall travel both escapeways in their entirety.

(b) **Content of quarterly training and drill.** Each quarterly evacuation training and drill shall include the following:

(1) Hands-on training on all types of self-rescue devices used at the mine, which includes—

(i) Instruction and demonstration in the use, care, and maintenance of self-rescue devices;

(ii) The complete donning of the SCSR by assuming a donning position, opening the device, activating the device, inserting the mouthpiece, and putting on the nose clip; and

(iii) Transferring between all applicable self-rescue devices.

(2) Training that emphasizes the importance of—

(i) Recognizing when the SCSR is not functioning properly and demonstrating how to initiate and reinitiate the starting sequence;

(ii) Not removing the mouthpiece, even to communicate, until the miner reaches fresh air; and

(iii) Proper use of the SCSR by controlling breathing and physical exertion.

(3) A realistic escapeway drill that is initiated and conducted with a different approved scenario each quarter and during which each miner—

(i) Travels the primary or alternate escapeway in its entirety, alternating escapeways each quarter;

(ii) Physically locates and practices using the continuous directional lifelines or equivalent devices and tethers, and physically locates the stored SCSRs and refuge alternatives;

(iii) Traverses undercasts or overcasts and doors;

(iv) Switches escapeways, as applicable; and

(v) Negotiates any other unique escapeway conditions.

(4) A review of the mine and escapeway maps, the firefighting plan, and the mine emergency evacuation plan in effect at the mine, which shall include:

- (i) Informing miners of the locations of fire doors, check curtains, changes in the routes of travel, and plans for diverting smoke from escapeways.
    - (ii) Locating escapeways, exits, routes of travel to the surface, abandoned areas, and refuge alternatives.
  - (5) Operation of the fire suppression equipment available in the mine and the location and use of firefighting equipment and materials.
  - (6) Reviewing the procedures for deploying refuge alternatives and components.
  - (7) For miners who will be constructing the 15 psi stoppings prior to an event, reviewing the procedures for constructing them.
  - (8) Reviewing the procedures for use of the refuge alternatives and components.
  - (9) Task training in proper transportation of the refuge alternatives and components.
- (c) **Annual expectations training.** Over the course of each year, each miner shall participate in expectations training that includes the following:
- (1) Donning and transferring SCSRs in smoke, simulated smoke, or an equivalent environment.
  - (2) Breathing through a realistic SCSR training unit that provides the sensation of SCSR airflow resistance and heat.
  - (3) Deployment and use of refuge alternatives similar to those in use at the mine, including—
    - (i) Deployment and operation of component systems; and
    - (ii) Instruction on when to use refuge alternatives during a mine emergency, emphasizing that it is the last resort when escape is impossible.
  - (4) A miner shall participate in expectations training within one-quarter of being employed at the mine.
- (d) **Certification of training and drills.** At the completion of each training or drill required in this section, the operator shall certify by signature and date that the training or drill was held in accordance with the requirements of this section.
- (1) This certification shall include the names of the miners participating in the training or drill. For each miner, this certification shall list the content of the training or drill component completed, including the escapeway traveled and scenario used, as required in paragraphs (b) and (c) of this section.
  - (2) Certifications shall be kept at the mine for one year.
  - (3) Upon request, the certifications shall be made available to an authorized representative of the Secretary and the representative of the miners.
  - (4) Upon request, a copy of the certification that shows his or her own training shall be provided to the participating miner.



**§ 208.45. Escapeway maps.**

The provisions of 30 CFR 75.1505 (relating to escapeway maps) are incorporated by reference.

**§ 75.1505 Escapeway maps.**

(a) **Content and accessibility.** An escapeway map shall show the designated escapeways from the working sections or the miners' work stations to the surface or the exits at the bottom of the shaft or slope, refuge alternatives, and SCSR storage locations. The escapeway map shall be posted or readily accessible for all miners—

- (1) In each working section;
- (2) In each area where mechanized mining equipment is being installed or removed;
- (3) At the refuge alternative; and
- (4) At a surface location of the mine where miners congregate, such as at the mine bulletin board, bathhouse, or waiting room.

(b) **Keeping maps current.** All maps shall be kept up-to-date and any change in route of travel, location of doors, location of refuge alternatives, or direction of airflow shall be shown on the maps by the end of the shift on which the change is made.

(c) **Informing affected miners.** Miners underground on a shift when any such change is made shall be notified immediately of the change and other affected miners shall be informed of the change before entering the underground areas of the mine.

**§ 208.46. Refuge alternatives.**

The provisions of 30 CFR 75.1506 (relating to refuge alternatives) are incorporated by reference.

**§ 75.1506 Refuge alternatives.**

(a) Each operator shall provide refuge alternatives and components as follows:

- (1) Prefabricated self-contained units, including the structural, breathable air, air monitoring, and harmful gas removal components of the unit, shall be approved under 30 CFR part 7; and
- (2) The structural components of units consisting of 15 psi stoppings constructed prior to an event shall be approved by the District Manager, and the breathable air, air monitoring, and harmful gas removal components of these units shall be approved under 30 CFR part 7.
- (3) Prefabricated refuge alternative structures that states have approved and those that MSHA has accepted in approved Emergency Response Plans (ERPs) that are in service prior to March 2, 2009 are permitted until December 31, 2018, or until replaced, whichever comes first. Breathable air, air-monitoring, and harmful gas

removal components of either a prefabricated self-contained unit or a unit consisting of 15 psi stoppings constructed prior to an event in a secure space and an isolated atmosphere that states have approved and those that MSHA has accepted in approved ERPs that are in use prior to March 2, 2009 are permitted until December 31, 2013, or until replaced, whichever comes first. Refuge alternatives consisting of materials pre-positioned for miners to deploy in a secure space with an isolated atmosphere that MSHA has accepted in approved ERPs that are in use prior to March 2, 2009 are permitted until December 31, 2010, or until replaced, whichever comes first.

(b) Except as permitted under paragraph (a)(3) of this section, each operator shall provide refuge alternatives with sufficient capacity to accommodate all persons working underground.

(1) Refuge alternatives shall provide at least 15 square feet of floor space per person and 30 to 60 cubic feet of volume per person according to the following chart. The airlock can be included in the space and volume if waste is disposed outside the refuge alternative.

<b>Mining height (inches)</b>	<b>Unrestricted volume (cubic feet) per person*</b>
36 or less	30
>36–≤42	37.5
>42–≤48	45
>48–≤54	52.5
>54	60

\* Includes an adjustment of 12 inches for clearances.

(2) Refuge alternatives for working sections shall accommodate the maximum number of persons that can be expected on or near the section at any time.

(3) Each refuge alternative for outby areas shall accommodate persons reasonably expected to use it.

(c) Refuge alternatives shall be provided at the following locations:

(1) Within 1,000 feet from the nearest working face and from locations where mechanized mining equipment is being installed or removed except that for underground anthracite coal mines that have no electrical face equipment, refuge alternatives shall be provided if the nearest working face is greater than 2,000 feet from the surface.

(2) Spaced within one-hour travel distances in outby areas where persons work such that persons in outby areas are never more than a 30-minute travel distance from a refuge alternative or safe exit. However, the operator may request, and the District Manager may approve a different location

in the ERP. The operator's request shall be based on an assessment of the risk to persons in outby areas, considering the following factors: proximity to seals; proximity to potential fire or ignition sources; conditions in the outby areas; location of stored SCSRs; and proximity to the most direct, safe, and practical route to an intake escapeway.

(d) Roof and rib support for refuge alternative locations shall be specified in the mine's roof control plan.

(e) The operator shall protect the refuge alternative and contents from damage during transportation, installation, and storage.

(f) A refuge alternative shall be removed from service if examination reveals damage that interferes with the functioning of the refuge alternative or any component.

(1) If a refuge alternative is removed from service, the operator shall withdraw all persons from the area serviced by the refuge alternative, except those persons referred to in § 104(c) of the Mine Act.

(2) Refuge alternative components removed from service shall be replaced or be repaired for return to service in accordance with the manufacturer's specifications.

(g) At all times, the site and area around the refuge alternative shall be kept clear of machinery, materials, and obstructions that could interfere with the deployment or use of the refuge alternative.

(h) Each refuge alternative shall be conspicuously identified with a sign or marker as follows:

(1) A sign or marker made of a reflective material with the word "REFUGE" shall be posted conspicuously at each refuge alternative.

(2) Directional signs made of a reflective material shall be posted leading to each refuge alternative location.

(i) During use of the refuge alternative, the atmosphere within the refuge alternative shall be monitored. Changes or adjustments shall be made to reduce the concentration of methane to less than one percent; to reduce the concentration of carbon dioxide to one percent or less and excursions not exceeding 2.5 percent; and to reduce the concentration of carbon monoxide to 25 ppm or less. Oxygen shall be maintained at 18.5 to 23 percent.

(j) Refuge alternatives shall contain a fire extinguisher that—

(1) Meets the requirements for portable fire extinguishers used in underground coal mines under this part;

(2) Is appropriate for extinguishing fires involving the chemicals used for harmful gas removal; and

(3) Uses a low-toxicity extinguishing agent that does not produce a hazardous by-product when activated.

**§ 208.47. Emergency response plan; refuge alternatives.**

The provisions of 30 CFR 75.1507 (relating to Emergency Response Plan; refuge alternatives) are incorporated by reference.

**§ 75.1507 Emergency Response Plan; refuge alternatives.**

(a) The Emergency Response Plan (ERP) shall include the following for each refuge alternative and component:

- (1) The types of refuge alternatives used in the mine, i.e., a prefabricated self-contained unit or a unit consisting of 15 psi stoppings constructed prior to an event in a secure space and an isolated atmosphere.
- (2) Procedures or methods for maintaining approved refuge alternatives and components.
- (3) The rated capacity of each refuge alternative, the number of persons expected to use each refuge alternative, and the duration of breathable air provided per person by the approved breathable air component of each refuge alternative.
- (4) The methods for providing breathable air with sufficient detail of the component's capability to provide breathable air over the duration stated in the approval.
- (5) The methods for providing ready backup oxygen controls and regulators.
- (6) The methods for providing an airlock and for providing breathable air in the airlock, except where adequate positive pressure is maintained.
- (7) The methods for providing sanitation facilities.
- (8) The methods for harmful gas removal, if necessary.
- (9) The methods for monitoring gas concentrations, including charging and calibration of equipment.
- (10) The method for providing lighting sufficient for persons to perform tasks.
- (11) Suitable locations for the refuge alternatives and an affirmative statement that the locations are—
  - (i) Not within direct line of sight of the working face; and
  - (ii) Where feasible, not placed in areas directly across from, nor closer than 500 feet radially from, belt drives, take-ups, transfer points, air compressors, explosive magazines, seals, entrances to abandoned areas, and fuel, oil, or other flammable or combustible material storage. However, the operator may request and the District Manager may approve an alternative location in the ERP if mining involves two-entry systems or yield pillars in a longwall that would prohibit locating the refuge alternative out of direct line of sight of the working face.
- (12) The maximum mine air temperature at each of the locations where refuge alternatives are to be placed.

(b) For a refuge alternative consisting of 15 psi stoppings constructed prior to an event in a secure space and an isolated atmosphere, the ERP shall specify that—

(1) The breathable air components shall be approved by MSHA; and

(2) The refuge alternative can withstand exposure to a flash fire of 300 degrees Fahrenheit (°F) for three seconds and a pressure wave of 15 pounds per square inch (psi) overpressure for 0.2 seconds.

(c) If the refuge alternative sustains persons for only 48 hours, the ERP shall detail advanced arrangements that have been made to assure that persons who cannot be rescued within 48 hours will receive additional supplies to sustain them until rescue. Advance arrangements shall include the following:

(1) Pre-surveyed areas for refuge alternatives with closure errors of less than 20,000:1.

(2) An analysis to demonstrate that the surface terrain, the strata, the capabilities of the drill rig, and all other factors that could affect drilling are such that a hole sufficient to provide required supplies and materials reliably can be promptly drilled within 48 hours of an accident at a mine.

(3) Permissions to cross properties, build roads, and construct drill sites.

(4) Arrangement with a drilling contractor or other supplier of drilling services to provide a suitable drilling rig, personnel, and support so that a hole can be completed to the refuge alternative within 48 hours.

(5) Capability to promptly transport a drill rig to a pre-surveyed location such that a drilled hole would be completed and located near a refuge alternative structure within 48 hours of an accident at a mine.

(6) The specifications of pipes, air lines, and approved fans or approved compressors that will be used.

(7) A method for assuring that within 48 hours, breathable air shall be provided.

(8) A method for assuring the immediate availability of a backup source for supplying breathable air and a backup power source for surface installations.

(d) The ERP shall specify that the refuge alternative is stocked with the following:

(1) A minimum of 2,000 calories of food and 2.25 quarts of potable water per person per day in approved containers sufficient to sustain the maximum number of persons reasonably expected to use the refuge alternative for at least 96 hours, or for 48 hours if advance arrangements are made under paragraph (c) of this section;

(2) A manual that contains sufficient detail for each refuge alternative or component addressing in-mine transportation, operation, and maintenance of the unit;

- (3) Sufficient quantities of materials and tools to repair components; and
- (4) First aid supplies.

**§ 208.48. Training and records for examination, maintenance and repair of refuge alternatives and components.**

The provisions of 30 CFR 75.1508 (relating to training and records for examination, maintenance, and repair of refuge alternatives and components) are incorporated by reference.

**§ 75.1508 Training and records for examination, maintenance, and repair of refuge alternatives and components.**

(a) Persons examining, maintaining, or repairing refuge alternatives and components shall be instructed in how to perform this work.

(1) The operator shall assure that all persons assigned to examine, maintain, and repair refuge alternatives and components are trained.

(2) The mine operator shall certify, by signature and date, the training of persons who examine, maintain, and repair refuge alternatives and components.

(b) At the completion of each repair, the person conducting the maintenance or repair shall make a record of all corrective action taken.

(c) Training certifications and repair records shall be kept at the mine for one year.

## **COMMUNICATIONS**

**§ 208.51. Communications facilities for refuge alternatives.**

The provisions of 30 CFR 75.1600-3 (relating to communications facilities; refuge alternatives) are incorporated by reference.

**§ 75.1600-3 Communications facilities; refuge alternatives.**

(a) Refuge alternatives shall be provided with a communications system that consists of—

(1) A two-way communication facility that is a part of the mine communication system, which can be used from inside the refuge alternative; and

(2) An additional communication system and other requirements as defined in the communications portion of the operator's approved Emergency Response Plan.

## **SELF-CONTAINED SELF-RESCUE DEVICES**

**§ 208.61. Availability of approved self-contained self-rescue devices; instruction in use and location.**

The provisions of 30 CFR 75.1714 (relating to availability of approved self-rescue devices; instruction in use and location) are incorporated by reference.

**§ 75.1714 Availability of approved self-rescue devices; instruction in use and location.**

(a) Each operator shall make available to each miner who goes underground, and to visitors authorized to enter the mine by the operator, an approved self-rescue device or devices which is adequate to protect such person for one hour or longer.

(b) Before any person authorized by the operator goes underground, the operator shall instruct and train such person in accordance with provisions set forth in 30 CFR part 48.

**§ 208.62. Approved self-contained self-rescue devices.**

The provisions of 30 CFR 75.1714-1 (relating to approved self-rescue devices) are incorporated by reference.

**§ 75.1714-1 Approved self-rescue devices.**

The requirements of § 75.1714 shall be met by making available to each person referred to in that section a self-rescue device or devices, which have been approved by MSHA and NIOSH under 42 CFR part 84, as follows:

(a) A 1-hour SCSR;

(b) A SCSR of not less than 10 minutes and a 1-hour canister;  
or

(c) Any other self-contained breathing apparatus which provides protection for a period of one hour or longer and which is approved for use by MSHA as a self-rescue device when used and maintained as prescribed by MSHA.

**§ 208.63. Self-contained self-rescue devices; use and location requirements.**

The provisions of 30 CFR 75.1714-2 (relating to self-rescue devices; use and location requirements) are incorporated by reference.

**§ 75.1714-2 Self-rescue devices; use and location requirements.**

(a) Self-rescue devices shall be used and located as prescribed in paragraphs (b) through (f) of this section.

(b) Except as provided in paragraph (c), (d), (e), or (f) of this section, self-rescue devices shall be worn or carried at all times by each person when underground.

(c) Where the wearing or carrying of the self-rescue device is hazardous to the person, it shall be placed in a readily accessible location no greater than 25 feet from such person.

(d) Where a person works on or around equipment, the self-rescue device may be placed in a readily accessible location on such equipment.

(e) A mine operator may apply to the District Manager under § 75.1502 for permission to place the SCSR more than 25 feet away.

(1) The District Manager shall consider the following factors in deciding whether to permit an operator to place a SCSR more than 25 feet from a miner:

- (i) Distance from affected sections to surface,
- (ii) Pitch of seam in affected sections,
- (iii) Height of coal seam in affected sections,
- (iv) Location of escapeways,
- (v) Proposed location of SCSRs,
- (vi) Type of work performed by affected miners,
- (vii) Degree of risk to which affected miners are exposed,
- (viii) Potential for breaking into oxygen deficient atmospheres,
- (ix) Type of risk to which affected miners are exposed,
- (x) Accident history of mine, and
- (xi) Other matters bearing upon the safety of miners.

(2) Such application shall not be approved by the District Manager unless it provides that, while underground, all miners whose SCSR is more than 25 feet away shall have a FSR approved by MSHA and NIOSH under 42 CFR part 84 sufficient to enable each miner to get to a SCSR.

(3) An operator may not obtain permission under paragraph (e) of this section to place SCSRs more than 25 feet away from miners on trips into and out of the mine.

(f) If an SCSR is not carried out of the mine at the end of a miner's shift, the place of storage shall be approved by the District Manager. A sign made of reflective material with the word "SCSRs" or "SELF-RESCUERS" shall be conspicuously posted at each SCSR storage location. Direction signs made of a reflective material shall be posted leading to each storage location.

(g) Where devices of not less than 10 minutes and one hour are made available in accordance with § 75.1714-1(b), such devices shall be used and located as follows:

(1) Except as provided in paragraphs (c) and (d) of this section, the device of not less than 10 minutes shall be worn or carried at all times by each person when underground, and

(2) The one-hour canister shall be available at all times to all persons when underground in accordance with a plan submitted by the mine operator and approved by the District Manager. When the one-hour canister is placed in a storage location, a sign made of a reflective material with the word "SCSRs" or "SELF-RESCUERS" shall be conspicuously posted at each storage location. Direction signs made of a reflective material shall be posted leading to each storage location.



**§ 208.64. Self-contained self-rescue devices; inspection, testing, maintenance, repair, and recordkeeping.**

The provisions of 30 CFR 75.1714-3 (relating to self-rescue devices; inspection, testing, maintenance, repair, and recordkeeping) are incorporated by reference.

**§ 75.1714-3 Self-rescue devices; inspection, testing, maintenance, repair, and recordkeeping.**

(a) Each operator shall provide for proper inspection, testing, maintenance, and repair of self-rescue devices by a person trained to perform such functions.

(b) After each time a self-rescue device is worn or carried by a person, the device shall be inspected for damage and for the integrity of its seal by a person trained to perform this function. Self-rescue devices with broken seals or which are damaged so that the device will not function properly shall be removed from service.

(c) All FSRs approved by MSHA and NIOSH under 42 CFR part 84, except devices using vacuum containers as the only method of sealing, shall be tested at intervals not exceeding 90 days by weighing each device on a scale or balance accurate to within + 1 gram. A device that weighs more than 10 grams over its original weight shall be removed from service.

(d) All SCSRs approved by MSHA and NIOSH under 42 CFR part 84 shall be tested in accordance with instructions approved by MSHA and NIOSH. Any device which does not meet the specified test requirements shall be removed from service.

(e) At the completion of each test required by paragraphs (c) and (d) of this section the person making the tests shall certify by signature and date that the tests were done. This person shall make a record of all corrective action taken. Certifications and records shall be kept at the mine and made available on request to an authorized representative of the Secretary.

(f) Self-rescue devices removed from service shall be repaired for return to service only by a person trained to perform such work and only in accordance with the manufacturer's instructions.

**§ 208.65. Additional self-contained self-rescue devices.**

The provisions of 30 CFR 75.1714-4 (relating to additional self-contained self-rescuers (SCSRs) are incorporated by reference.

**§ 75.1714-4 Additional self-contained self-rescuers (SCSRs).**

(a) **Additional SCSRs in work places.** In addition to the requirements in §§ 75.1714, 75.1714-1, 75.1714-2, and 75.1714-3 of this part, the mine operator shall provide the following:

(1) At least one additional SCSR, which provides protection for a period of one hour or longer, for each person at a fixed underground work location.

(2) Additional SCSRs along the normal travel routes for pumpers, examiners, and other persons who do not have a fixed work location to be stored at a distance an average miner could walk in 30 minutes. The SCSR storage locations shall be determined by using one of the methods found under paragraph (c)(2) of this section.

(b) **Additional SCSRs on mantrips.** If a mantrip or mobile equipment is used to enter or exit the mine, at least one additional SCSR, which provides protection for a period of one hour or longer, shall be available for each person who uses such transportation from portal to portal.

(c) **Additional SCSRs in escapeways.** When each person underground cannot safely evacuate the mine within 30 minutes, the mine operator shall provide additional SCSRs stored in each required escapeway.

(1) Each storage location shall contain at least one SCSR, which provides protection for a period of one hour or longer, for every person who will be in by that location.

(2) Storage locations shall be spaced along each escapeway at 30-minute travel distances no greater than the distances determined by—

(i) Calculating the distance an average miner walks in 30 minutes by using the time necessary for each miner in a sample of typical miners to walk a typical length of each escapeway; or

(ii) Using the SCSR storage location spacing specified in the following table, except for escapeways with grades over five percent.

<b>Average entry height</b>	<b>Maximum distance between SCSR storage locations (in ft.)</b>
<40 in. (Crawl)	2,200
>40–<50 in. (Duck Walk)	3,300
>50–<65 in. (Walk Head Bent)	4,400
>65 in. (Walk Erect)	5,700

(d) **Additional SCSRs in hardened rooms.** As an alternative to providing SCSR storage locations in each escapeway, the mine operator may store SCSRs in a hardened room located between adjacent escapeways.

(1) The hardened room shall be designed and constructed to the same explosion force criteria as seals.

(2) The hardened room shall include a means to provide independent, positive-pressure ventilation from the surface during an emergency.

(3) The District Manager shall approve the design and construction of hardened rooms in the ventilation plan.

(4) These SCSR storage locations shall be spaced in accordance with paragraph (c) of this section.

(e) **Storage location accessibility.** All SCSRs required under this section shall be stored according to the manufacturers' instructions, in conspicuous locations readily accessible by each person in the mine.

(f) **Storage location signs.** A sign made of reflective material with the words "SCSRs" or "SELF-RESCUERS" shall be conspicuously posted at each storage location. Direction signs made of a reflective material shall be posted leading to each storage location.

#### **§ 208.66. Map locations.**

The provisions of 30 CFR 75.1714-5 (relating to map locations of self-contained self-rescuers (SCSR)) are incorporated by reference.

#### **§ 75.1714-5 Map locations of self-contained self-rescuers (SCSR).**

The mine operator shall indicate the locations of all stored SCSRs on the mine maps required by §§ 75.1200 and 75.1505 of this part.

#### **§ 208.67. Emergency tethers.**

The provisions of 30 CFR 75.1714-6 (relating to emergency tethers) are incorporated by reference.

#### **§ 75.1714-6 Emergency tethers.**

At least one tether, which is a durable rope or equivalent material designed to permit members of a mine crew to link together while evacuating the mine during an emergency, shall be provided and stored with the additional SCSRs on the fixed work location and on the mobile equipment required in §§ 75.1714-4(a)(1) and (b) of this part.

#### **§ 208.68. Multi-gas detectors.**

The provisions of 30 CFR 75.1714-7 (relating to multi-gas detectors) are incorporated by reference.

#### **§ 75.1714-7 Multi-gas detectors.**

(a) **Availability.** A mine operator shall provide an MSHA-approved, handheld, multi-gas detector that can

measure methane, oxygen, and carbon monoxide to each group of underground miners and to each person who works alone, such as pumpers, examiners, and outby miners.

(b) **Qualified person.** At least one person in each group of underground miners shall be a qualified person under § 75.150 of this part and each person who works alone shall be trained to use the multi-gas detector.

(c) **Maintenance and calibration.** Multi-gas detectors shall be maintained and calibrated as specified in § 75.320 of this part.

### **§ 208.69. Reporting SCSR inventory, malfunctions and retention.**

The provisions of 30 CFR 75.1714-8 (relating to reporting SCSR inventory and malfunctions; retention of SCSRs) are incorporated by reference.

#### **§ 75.1714-8 Reporting SCSR inventory and malfunctions; retention of SCSRs.**

(a) **SCSR inventory.** A mine operator shall submit to MSHA a complete inventory of all SCSRs at each mine. New mines shall submit the inventory within three months of beginning operation.

(1) The inventory shall include—

- (i) Mine name, MSHA mine ID number, and mine location; and
- (ii) For each SCSR unit, the manufacturer, the model type, the date of manufacture, and the serial number.

(2) In the event that a change in the inventory occurs, a mine operator shall report the change to MSHA within the quarter that the change occurs (Jan–Mar, Apr–Jun, Jul–Sep, Oct–Dec).

(b) **Reporting SCSR problems.** A mine operator shall report to MSHA any defect, performance problem, or malfunction with the use of an SCSR. The report shall include a detailed description of the problem and, for each SCSR involved, the information required by paragraph (a)(1) of this section.

(c) **Retention of problem SCSRs.** The mine operator shall preserve and retain each SCSR reported under paragraph (b) of this section for 60 days after reporting the problem to MSHA.

### **AUTOMATED EXTERNAL DEFIBRILLATORS**

#### **§ 208.70. Automated external defibrillators.**

(a) *Location.* A mine operator, in consultation with emergency medical technicians, shall provide for use in an emergency one AED at the following locations:

- (1) At a location on the surface in close proximity to the mine entry at the same location where the first aid equipment is stored.

(2) At a point in each working section not more than 1,000 feet outby the active working face or faces at the same location where the first aid equipment is stored.

(b) *Training.*

(1) Emergency medical technicians and emergency medical technician paramedics at the mine shall complete training in the use of an AED. The mine operator may include the required AED training in its continuing education plan for emergency medical personnel. Training in the use of the AED for emergency medical technicians and emergency medical technician paramedics shall be provided in accordance with the standards of the American Heart Association, the American National Red Cross or through an equivalent course of instruction approved by the Department of Health.

(2) Mine personnel, other than emergency medical technicians and emergency medical technician paramedics, shall receive yearly training in the operation of the AED. Training may be provided as part of the annual refresher training provided under 30 CFR 48.8(c) (relating to annual refresher training of miners; minimum courses of instruction; hours of instruction).

(c) *Maintenance and inspection.* AEDs shall be maintained and inspected according to manufacturer's operational guidelines.

(d) *Good Samaritans.* Section 8331.2 of 42 Pa.C.S. (relating to Good Samaritan civil immunity for use of automated external defibrillator) applies to miners who render care with an AED.

**30 CFR 48.8(c)**

Refresher training may include other health and safety subjects that are relevant to mining operations at the mine. Recommended subjects include, but are not limited to, information about the physical and health hazards of chemicals in the miner's work area, the protective measures a miner can take against these hazards, and the contents of the mine's HazCom program.

**§ 8331.2. Good Samaritan civil immunity for use of automated external defibrillator.**

**(a) General rule.**-Any person who in good faith acquires and maintains an AED or uses an AED in an emergency shall not be liable for any civil damages as a result of any acts or omissions by an individual using the AED, except if acts or omissions intentionally designed to harm or any grossly negligent acts or omissions result in harm to the individual receiving the AED treatment.

**(b) Requirements.**-Any person who acquires and maintains an AED for use in accordance with this section shall:

(1) Ensure that expected AED users receive training pursuant to subsection (c).

(2) Maintain and test the AED according to the manufacturer's operational guidelines.

(3) Provide instruction requiring the user of the AED to utilize available means to immediately contact and activate the emergency medical services system.

(4) Assure that any appropriate data or information is made available to emergency medical services personnel or other health care providers as requested.

**(c) Training.**-For purposes of this section, expected AED users shall complete training in the use of an AED consistent with American Red Cross, American Heart Association or other national standards as identified and approved by the Department of Health in consultation with the Pennsylvania Emergency Health Services Council.

**(d) Obstruction of emergency medical services personnel.**-Nothing in this section shall relieve a person who uses an AED from civil damages when that person obstructs or interferes with care and treatment being provided by emergency medical services personnel or a health professional.

**(e) Exception.**-(Deleted by amendment).

**(f) Definitions.**-As used in this section, the following words and phrases shall have the meanings given to them in this subsection:

"Automated external defibrillator" or "AED." A portable device that uses electric shock to restore a stable heart rhythm to an individual in cardiac arrest.

"Emergency." A situation where an individual is believed to be in cardiac arrest or is in need of immediate medical attention to prevent death or serious injury.

"Good faith." Includes a reasonable opinion that the immediacy of the situation is such that the use of an AED should not be postponed until emergency medical services personnel arrive or the person is hospitalized.

## **COMBUSTIBLE MATERIALS AND ROCK DUSTING**

### **§ 208.71. Maintenance of incombustible content of rock dust.**

(a) Where rock dust is required to be applied, it shall be distributed upon the top, floor and sides of the underground areas of a coal mine and maintained in quantities so that the incombustible content of the combined coal dust, rock dust and other dust is not less than 80%.

(b) Where methane is present in a ventilating current, the percent of incombustible content of the combined dust as required under subsection (a) shall be increased 0.4% for each 0.1% of methane.

(c) Moisture in the combined coal dust, rock dust and other dusts shall be considered as a part of the incombustible content of the mixture.

## **HIGH-VOLTAGE CONTINUOUS MINING MACHINE STANDARDS FOR UNDERGROUND COAL MINES**

### **§ 208.81. Scope.**

The provisions of 30 CFR 75.823 (relating to scope) are incorporated by reference.

### **§ 75.823 Scope.**

Sections 75.823 through 75.834 of this part are electrical safety standards applicable to 2,400 volt continuous mining machines and circuits. A “qualified person” as used in these sections means a person meeting the requirements of § 75.153. Other standards in 30 CFR apply to these circuits and equipment where appropriate.

### **§ 208.82. Electrical protection.**

The provisions of 30 CFR 75.824 (relating to electrical protection) are incorporated by reference.

### **§ 75.824 Electrical protection.**

(a) **Trailing cable protection.** The trailing cable extending to the high-voltage continuous mining machine must be protected by a circuit-interrupting device of adequate interrupting capacity and voltage that provides short-circuit, overload, ground-fault, and under-voltage protection as follows:

#### **(1) Short-circuit protection.**

(i) The current setting of the device must be the setting specified in the approval documentation or 75 percent of the minimum available phase-to-phase short-circuit current, whichever is less; and

(ii) The time-delay setting must not exceed 0.050 seconds.

#### **(2) Ground-fault protection.**

(i) Neutral grounding resistors must limit the ground-fault current to no more than 0.5 ampere.

(ii) Ground-fault devices must cause de-energization of the circuit extending to the continuous mining machine at not more than 0.125 ampere. The time-delay of the device must not exceed 0.050 seconds.

(iii) Look-ahead circuits must detect a ground-fault condition and prevent the circuit-interrupting device from closing as long as the ground-fault condition exists.

(iv) Backup ground-fault devices must cause de-energization of the circuit extending to the continuous mining machine 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 seconds.

(v) Thermal devices must detect a sustained ground-fault current in the neutral grounding resistor and must de-energize the incoming power. The device must

operate at either 50 percent of the maximum temperature rise of the neutral grounding resistor or 302°F (150°C), whichever is less. Thermal protection must not be dependent on control power and may consist of a current transformer and over-current relay in the neutral grounding resistor circuit.

(vi) A single window-type current transformer that encircles all three-phase conductors must be used to activate the ground-fault device protecting the continuous mining machine. Equipment grounding conductors must not pass through the current transformer.

(vii) A test circuit for the ground-fault device must be provided. The test circuit 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) **Under-voltage protection.** The under-voltage device must operate on a loss of voltage, de-energize the circuit, and prevent the equipment from automatically restarting.

(b) **Re-closing.** Circuit-interrupting devices must not re-close automatically.

(c) **Onboard Power Circuits.** When a grounded-phase indicator light circuit is used and it indicates a grounded-phase fault, the following corrective actions must be taken:

(1) The machine must be moved immediately to a location with a properly supported roof; and

(2) The grounded-phase condition must be located and corrected prior to placing the continuous mining machine back into operation.

### § 208.83. Power centers.

The provisions of 30 CFR 75.825 (relating to power centers) are incorporated by reference.

#### § 75.825 Power centers.

(a) **Main disconnecting switch.** The power center supplying high voltage power to the continuous mining machine must be equipped with a main disconnecting switch that, when in the open position, de-energizes input to all power transformers.

(b) **Trailing cable disconnecting device.** In addition to the main disconnecting switch required in paragraph (a) of this section, the power center must be equipped with a disconnecting device for each circuit that supplies power to a high-voltage continuous mining machine. A disconnecting device is defined as a disconnecting switch or a cable coupler.



(c) **Disconnecting switches.** Each disconnecting switch must be labeled to clearly identify the circuit it disconnects, and be designed and installed as follows:

- (1) Rated for the maximum phase-to-phase voltage of the circuit;
- (2) Rated for the full-load current of the circuit that is supplied power through the device.
- (3) Allow for visual observation, without removing any covers, to verify that the contacts are open;
- (4) Ground all power conductors on the load side when the switch is in the “open and grounded” position;
- (5) Can only be locked out in the “open and grounded” position; and
- (6) Safely interrupts the full-load current of the circuit or causes the current to be interrupted automatically before the disconnecting switch opens.

(d) **Barriers and covers.** All compartments that provide access to high-voltage circuits must have barriers and/or covers to prevent miners from contacting energized high-voltage circuits.

(e) **Main disconnecting switch and control circuit interlocking.** The control circuit must be interlocked with the main disconnecting switch in the power center so that:

- (1) When the main disconnecting switch is in the “open” position, the control circuit can only be powered through an auxiliary switch in the “test” position; and
- (2) When the main disconnecting switch is in the “closed” position, the control circuit can only be powered through an auxiliary switch in the “normal” position.

(f) **Interlocks.** Each cover or removable barrier providing access to high-voltage circuits must be equipped with at least two interlock switches. Except when the auxiliary switch is on the “test” position, removal of any cover or barrier that exposes energized high-voltage circuits must cause the interlock switches to automatically de-energize the incoming circuit to the power center.

(g) **Emergency stop switch.** The power center must be equipped with an externally accessible emergency stop switch hard-wired into the incoming ground-wire monitor circuit that de-energizes the incoming high-voltage in the event of an emergency.

(h) **Grounding stick.** The power center must be equipped with a grounding stick to be used prior to performing electrical work to assure that high-voltage capacitors are discharged and circuits are de-energized. 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.

(i) **Caution label.** All compartments providing access to energized high-voltage conductors and parts must display a

caution label to warn miners against entering the compartments before de-energizing incoming high-voltage circuits.

**§ 208.84. High-voltage trailing cables.**

The provisions of 30 CFR 75.826 (relating to high-voltage trailing cables) are incorporated by reference.

**§ 75.826 High-voltage trailing cables.**

High-voltage trailing cables must:

- (a) Meet existing trailing cable requirements and the approval requirements of the high-voltage continuous mining machine; and
- (b) Meet existing ground-check conductor requirements (§ 75.804) or have a stranded center ground-check conductor not smaller than a No. 16 A.W.G.

**§ 208.85. Guarding of trailing cables.**

The provisions of 30 CFR 75.827 (relating to guarding of trailing cables) are incorporated by reference.

**§ 75.827 Guarding of trailing cables.**

**(a) Guarding.**

(1) The high-voltage cable must be guarded in the following locations:

- (i) From the power center cable coupler for a distance of 10 feet in by the power center;
- (ii) From the entrance gland for a distance of 10 feet out by the last strain clamp on the continuous mining machine; and,
- (iii) At any location where the cable could be damaged by moving equipment.

(2) Guarding must be constructed using nonconductive flame-resistant material or grounded metal.

**(b) Suspended cables and cable crossovers.** When equipment must cross any portion of the cable, the cable must be either:

- (1) Suspended from the mine roof; or
- (2) Protected by a cable crossover having the following specifications:

- (i) A minimum length of 33 inches;
- (ii) A minimum width of 17 inches;
- (iii) A minimum height of three inches;
- (iv) A minimum cable placement area of two and one half-inches ( $2\frac{1}{2}$ " ) high by four and one-quarter inches ( $4\frac{1}{4}$ " ) wide;
- (v) Made of nonconductive material;
- (vi) Made of material with a distinctive color. The color black must not be used; and
- (vii) Made of material that has a minimum compressive strength of 6,400 pounds per square inch (psi).

**§ 208.86. Trailing cable pulling.**

The provisions of 30 CFR 75.828 (relating to trailing cable pulling) are incorporated by reference.

**§ 75.828 Trailing cable pulling.**

The trailing cable must be de-energized prior to being pulled by any equipment other than the continuous mining machine. The cable manufacturer's recommended pulling procedures must be followed when pulling the trailing cable with equipment other than the continuous mining machine.

**§ 208.87. Tramming continuous mining machines in and out of the mine and from section to section.**

The provisions of 30 CFR 75.829 (relating to tramming continuous mining machines in and out of the mine and from section to section) are incorporated by reference.

**§ 75.829 Tramming continuous mining machines in and out of the mine and from section to section.**

(a) **Conditions of use.** Tramming the continuous mining machine in and out of the mine and from section to section must be done in accordance with movement requirements of high-voltage power centers and portable transformers (§ 75.812) and as follows:

- (1) The power source must not be located in areas where permissible equipment is required;
- (2) The continuous mining machine must not be used for mining or cutting purposes, unless a power center is used in accordance with §§ 75.823 through 75.828 and §§ 75.830 through 75.833;
- (3) Low-, medium-, and high-voltage cables must comply with §§ 75.600–1, 75.907, and 75.826, as applicable; and
- (4) The energized high-voltage cable must be mechanically secured onboard the continuous mining machine. This provision applies only when using the power sources specified in paragraphs (c)(2) and (c)(3) of this section.

(b) **Testing prior to tramming.** Prior to tramming the continuous mining machine,

- (1) A qualified person must activate the ground-fault and ground-wire monitor test circuits of the power sources specified in paragraph (c) of this section to assure that the corresponding circuit-interrupting device opens the circuit. Corrective actions and recordkeeping resulting from these tests must be in accordance with §§ 75.832(f) and (g).
- (2) Where applicable, a person designated by the mine operator must activate the test circuit for the grounded-phase detection circuit on the continuous mining machine to assure that the detection circuit is functioning properly. Corrective actions resulting from this test must be in accordance with § 75.832(f).

(c) **Power sources.** In addition to the power center specified in § 75.825, the following power sources may be used to tram the continuous mining machine.

(1) **Medium-voltage power source.** A medium-voltage power source is a source that supplies 995 volts through a trailing cable (See Figure 1 of this section) to the continuous mining machine. The medium-voltage power source must—

- (i) Not be used to back-feed the high-voltage circuits of the continuous mining machine; and
- (ii) Meet all applicable requirements for medium-voltage circuits in 30 CFR 75.

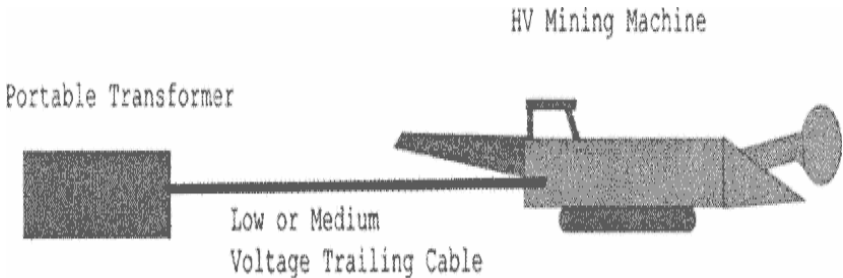


Figure 1-Power Source-75.829(c)(1) 995 volts used for tramping

(2) **Step-up transformer.** A step-up transformer is a transformer that steps up the low or medium voltage to high voltage (See Figure 2 in this section) and must meet the following requirements:

- (i) The trailing cable supplying low or medium voltage to the step-up transformer must meet the applicable requirements of 30 CFR part 75;
- (ii) The high-voltage circuit output of the step-up transformer supplying power to the continuous mining machine must meet the applicable provisions of § 75.824;
- (iii) The step-up transformer enclosure must be—
  - (A) Securely mounted to minimize vibration on:
    - (1) The continuous mining machine; or
    - (2) A sled/cart that must be connected to the continuous mining machine by a tow-bar and be in close proximity to the mining machine.
  - (B) Grounded as follows:
    - (1) Connected to the incoming ground conductor of the low or medium-voltage trailing cable;
    - (2) Bonded by a No. 1/0 A.W.G. or larger external grounding conductor to the continuous mining machine frame; and

- (3) Bonded by a No. 1/0 A.W.G. or larger external grounding conductor to the metallic shell of each cable coupler.
- (C) Equipped with:
- (1) At least two interlock switches for each of the enclosure covers; and
  - (2) An external emergency stop switch to remove input power to the step-up transformer.

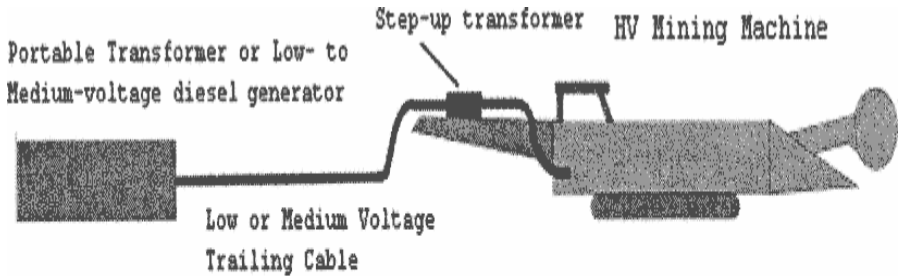


Figure 2 - Power source - 75.829(c) (2) 480 or 995 volts to a step-up transformer to 2300 volts for tramming

**§ 208.88. Splicing and repair of trailing cables.**

(a) *Incorporation by reference.* The provisions of 30 CFR 75.830(a) (relating to splicing and repair of trailing cables) are incorporated by reference.

(b) **Splicing limitations.**

- (1) Splicing of the high-voltage trailing cable within 50 feet of the continuous mining machine is prohibited.
- (2) The provisions of 30 CFR 75.830(b)(2) are incorporated by reference.

**§ 75.830(a) Splicing and repair of trailing cables.**

(a) **Splices and repairs.**

- (1) Splicing means the mechanical joining of one or more severed conductors in a single length of a cable including the replacement of: Insulation, semi-conductive tape, metallic shielding, and the outer jacket(s).
- (2) Repair means to fix damage to any component of the cable other than the conductor.
- (3) Splices and repairs to high-voltage trailing cables must be made:
  - (i) Only by a qualified person trained in the proper methods of splicing and repairing high-voltage trailing cables;
  - (ii) In a workman-like manner;
  - (iii) In accordance with § 75.810; and
  - (iv) Using only MSHA-approved high-voltage kits that include instructions for outer-jacket repairs and splices.

**§ 75.830 (b)(2) Splicing limitations.**

(2) Only four (4) splices will be allowed at any one time for the portion of the trailing cable that extends from the continuous miner outby for a distance of 300 feet.

**§ 208.89. Electrical work; troubleshooting and testing.**

The provisions of 30 CFR 75.831 (relating to electrical work; troubleshooting and testing) are incorporated by reference.

**§ 75.831 Electrical work; troubleshooting and testing.**

(a) **Trailing cable and continuous mining machine electrical work procedures.** Prior to performing electrical work, other than troubleshooting and testing, on the high-voltage trailing cable or the continuous mining machine, a qualified person must de-energize the power center and follow procedures specified in paragraph (1) or (2):

- (1) If a trailing cable disconnecting switch is provided:
  - (i) Open and ground the power conductors, lock out and tag the disconnecting switch; and
  - (ii) Lock out and tag the plug to the power receptacle.
- (2) If a trailing cable disconnecting switch is not provided and a cable coupler is used as a disconnecting device:
  - (i) Remove the plug from the power receptacle and connect it to the grounding receptacle;
  - (ii) Lock out and tag the plug to the grounding receptacle; and
  - (iii) Place a dust cover over the power receptacle.

(b) **Troubleshooting and testing the trailing cable.** During troubleshooting and testing, the de-energized high-voltage cable may be disconnected from the power center only for that period of time necessary to locate the defective condition. Prior to troubleshooting and testing trailing cables, a qualified person must perform the following:

- (1) If a trailing cable disconnecting switch is provided:
  - (i) Open and ground power conductors and lock out and tag the disconnecting switch;
  - (ii) Disconnect the plug from the power receptacle;
  - (iii) Lock out and tag the plug; and
  - (iv) Place a dust cover over the power receptacle.
- (2) If a trailing cable disconnecting switch is not provided and a cable coupler is used as a disconnecting device:
  - (i) Remove the plug from the power receptacle and connect it to the grounding receptacle to ground the power conductors;
  - (ii) Remove the plug from the grounding receptacle and install a lock and tag on the plug; and
  - (iii) Place a dust cover over the power receptacle.

(c) **Troubleshooting and testing limitations.** Troubleshooting and testing energized circuits must be performed only:

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

- (2) When the purpose of troubleshooting and testing is to determine voltages and currents;
- (3) By qualified persons; and
- (4) When using 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.

(d) **Power center electrical work procedures.** Before any work is performed inside any compartment of the power center, except for troubleshooting and testing energized circuits as specified in paragraph (c) of this section, a qualified person must:

- (1) De-energize affected circuits;
- (2) Open the corresponding disconnecting switch, lock it out, and tag it to assure the circuit is isolated;
- (3) Visually verify that the contacts of the disconnecting switch are open and grounded; and
- (4) Discharge all high-voltage capacitors and circuits.

(e) **Locking out and tagging responsibilities.**

- (1) When more than one qualified person is performing electrical work, including troubleshooting and testing, each person must install an individual lock and tag. Each lock and tag must be removed only by the persons who installed them.
- (2) If the person who installed the lock and tag is unavailable, the lock and tag may be removed by a person authorized by the operator, provided that:
  - (i) The authorized person is a qualified person; and
  - (ii) The mine operator assures that the person who installed the lock and tag is aware that the lock and tag have been removed.

### **§ 208.90. Frequency of examinations; recordkeeping.**

The provisions of 30 CFR 75.832 (relating to frequency of examinations; recordkeeping) are incorporated by reference.

#### **§ 75.832 Frequency of examinations; recordkeeping.**

(a) **Continuous mining machine examination.** At least once every seven days, a qualified person must examine each high-voltage continuous mining machine to verify that electrical protection, equipment grounding, permissibility,

cable insulation, and control devices are properly installed and maintained.

(b) **Ground-fault test circuit.** At least once every seven days, and prior to tramping the high-voltage continuous mining machine, a qualified person must activate the ground-fault test circuit to verify that it will cause the corresponding circuit-interrupting device to open.

(c) **Ground-wire monitor test.** At least once every seven days, and prior to tramping the high-voltage continuous mining machine, a qualified person 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 inspections.**

(1) Once each day during the shift that the continuous mining machine is first energized, a qualified person must de-energize and inspect the entire length of the high-voltage trailing cable from the power center to the continuous mining machine. The inspection must include examination of the outer jacket repairs and splices for damage, and assure guarding is provided where required.

(2) At the beginning of each shift that the continuous mining machine is energized, a person designated by the mine operator must de-energize and visually inspect the high-voltage trailing cable for damage to the outer jacket. This inspection must be conducted from the continuous mining machine to the following locations:

- (i) The last open crosscut;
- (ii) Within 150 feet of the working place during retreat or second mining; or
- (iii) Up to 150 feet from the continuous mining machine when the machine is used in outby areas.

(e) **Grounded-phase detection test.** When a grounded-phase test circuit is provided on a high-voltage continuous mining machine, a person designated by the mine operator must activate the test circuit at the beginning of each production shift to assure that the detection circuit is functioning properly.

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

(g) **Record of tests.**

(1) At the completion of examinations and tests required under paragraphs (a), (b), and (c) of this section, the person conducting the examinations and tests must:

- (i) Certify by signature and date that the examinations and tests have been conducted.
- (ii) Make a record of any unsafe condition found.

(2) Any corrective action(s) must be recorded by the person taking the corrective action.



(3) The record must be countersigned by the mine foreman or equivalent mine official by the end of the mine foreman's or the equivalent mine official's next regularly scheduled working shift.

(4) Records must be maintained in a secure book that is not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration.

(5) 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.

**§ 208.91. Handling high-voltage trailing cables.**

The provisions of 30 CFR 75.833 (relating to handling high-voltage trailing cables) are incorporated by reference.

**§ 75.833 Handling high-voltage trailing cables.**

**(a) Cable handling.**

(1) Miners must not handle energized trailing cables unless they are wearing high-voltage insulating gloves, which include the rubber gloves and leather outer protector gloves, or are using insulated cable handling tools that meet the requirements of paragraph (c) or (d) of this section.

(2) Miners must not handle energized high-voltage cables with any parts of their bodies except by hand in accordance with paragraph (1) above.

**(b) Availability.** Each mine operator must make high-voltage insulating gloves or insulated cable handling tools available to miners handling energized high-voltage trailing cables.

**(c) High-voltage insulating gloves.** High-voltage insulating gloves must meet the following requirements:

(1) The rubber gloves must be designed and maintained to have a voltage rating of at least Class 1 (7,500 volts) and tested every 30 days in accordance with publication ASTM F496–02a, “Standard Specification for In-Service Care of Insulating Gloves and Sleeves” (2002). The Director of the Federal Register approved this incorporation by reference in accordance with 5 U.S.C. 522(a) and 1 CFR part 51. ASTM F496–02a may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959, call 610–832–9500 or go to <http://www.astm.org>. ASTM F496–02a is available for inspection at any MSHA Coal Mine Safety and Health District Office, at the MSHA Office of Standards, Regulations, and Variances, 201 12<sup>th</sup> Street South, Arlington, VA 22202–5452; 202-693–9440; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to:

[http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(2) The rubber glove portion must be air-tested at the beginning of each shift to assure its effectiveness.

(3) Both the leather protector and rubber insulating gloves must be visually examined before each use for signs of damage or defects.

(4) Damaged rubber gloves must be removed from the underground area of the mine or destroyed. Leather protectors must be maintained in good condition or replaced.

**(d) Insulated cable handling tools.** Insulated cable handling tools must be:

(1) Rated and properly maintained to withstand at least 7,500 volts;

(2) Designed and manufactured for cable handling;

(3) Visually examined before each use for signs of damage or defects; and

(4) Removed from the underground area of the mine or destroyed if damaged or defective.

### **§ 208.92. Training.**

The provisions of 30 CFR 75.834 (relating to training) are incorporated by reference.

#### **§ 75.834 Training.**

In addition to existing part 48 task training, hazard training, training for qualified persons under existing § 75.153, and annual refresher training, the following specialized training shall be provided and specified in the part 48 plan:

(a) Training for miners who perform maintenance on high-voltage continuous mining machines in high-voltage safety, testing, and repair and maintenance procedures.

(b) Training for personnel who work in the vicinity of high-voltage continuous mining machines in safety procedures and precautions for moving the high-voltage machines or the trailing cables.

### **§ 208.93. Installation of electric equipment and conductors; permissibility.**

The provisions of 30 CFR 75.1002 (relating to installation of electric equipment and conductors; permissibility) are incorporated by reference.

#### **§ 75.1002 Installation of electric equipment and conductors; permissibility.**

(a) Electric equipment must be permissible and maintained in a permissible condition when such equipment is located within 150 feet of pillar workings or longwall faces.

(b) Electric conductors and cables installed in or in by the last open crosscut or within 150 feet of pillar workings or longwall faces must be—

- (1) Shielded high-voltage cables supplying power to permissible longwall equipment;
- (2) Interconnecting conductors and cables of permissible longwall equipment;
- (3) Conductors and cables of intrinsically safe circuits; and
- (4) Cables and conductors supplying power to low and medium-voltage permissible equipment.
- (5) Shielded high-voltage cables supplying power to permissible continuous mining machines.

### **QUALIFIED AND CERTIFIED PERSONS**

#### **§ 208.101. Certified person.**

The provisions of 30 CFR 77.100 (relating to certified person) are incorporated by reference.

#### **§ 77.100 Certified person.**

(a)

(1) The provisions of this Part 77 require that certain examinations and tests be made by a certified person. A certified person within the meaning of these provisions is a person who has been certified in accordance with the provisions of paragraph (b) of this § 77.100 to perform the duties, and make the examinations and tests which are required by this Part 77 to be performed by a certified person.

(2) A person who has been so certified shall also be considered to be a qualified person within the meaning of those provisions of this Part 77 which require that certain examinations, tests and duties be performed by a qualified person, except those provisions in Subparts F, G, H, I, and J of this part relating to performance of electrical work.

(b) Pending issuance of Federal standards, a person will be considered, to the extent of the certification, a certified person to make examinations, tests and perform duties which are required by this Part 77 to be performed by a certified person:

(1) If he has been certified for such purpose by the State in which the coal mine is located; or

(2) If this person has been certified for such purpose by the Secretary. A person's initial certification is valid for as long as the person continues to satisfy the requirements necessary to obtain the certification and is employed at the same coal mine or by the same independent contractor. The mine operator or independent contractor shall make an application which satisfactorily shows that each such person has had at least two years experience at a coal mine or equivalent experience, and that each such person demonstrates to the satisfaction of an authorized representative of the Secretary that such person is able and competent to test for oxygen

deficiency with a permissible flame safety lamp, or any other device approved by the Secretary and to test for methane with a portable methane detector approved by the Bureau of Mines, MESA, or MSHA, under Part 22 of this Chapter (Bureau of Mines Schedule 8C), and to perform such other duties for which application for certification is made.

**§ 208.102. Tests for methane and for oxygen deficiency; qualified person.**

The provisions of 30 CFR 77.101 (relating to tests for methane and for oxygen deficiency; qualified person) are incorporated by reference.

**§ 77.101 Tests for methane and for oxygen deficiency; qualified person.**

(a) The provisions of Subparts C, P, R, and T of this Part 77 require that tests for methane and for oxygen deficiency be made by a qualified person. A person is a qualified person for these purposes if he is a certified person for such purposes under § 77.100.

(b) Pending issuance of Federal standards, a person will be considered a qualified person for testing for methane and oxygen deficiency:

- (1) If he has been qualified for this purpose by the State in which the coal mine is located; or
- (2) If he has been qualified by the Secretary for these purposes upon a satisfactory showing by the operator of the coal mine that each such person has been trained and designated by the operator to test for methane and oxygen deficiency.

**§ 208.103. Tests for methane; oxygen deficiency; qualified person, additional requirement.**

The provisions of 30 CFR 77.102 (relating to tests for methane; oxygen deficiency; qualified person, additional requirement) are incorporated by reference.

**§ 77.102 Tests for methane; oxygen deficiency; qualified person, additional requirement.**

Notwithstanding the provisions of § 77.101, on and after December 30, 1971, no person shall be a qualified person for testing for methane and oxygen deficiency unless he has demonstrated to the satisfaction of an authorized representative of the Secretary that he is able and competent to make such tests and the Mine Safety and Health Administration has issued him a current card which qualifies him to make such tests.

**§ 208.104. Electrical work; qualified person.**

The provisions of 30 CFR 77.103 (relating to electrical work; qualified person) are incorporated by reference.

**§ 77.103 Electrical work; qualified person.**

(a) Except as provided in paragraph (f) of this section, an individual is a qualified person within the meaning of Subparts F, G, H, I, and J of this Part 77 to perform electrical work (other than work on energized surface high-voltage lines) if:

(1) He has been qualified as a coal mine electrician by a State that has a coal mine electrical qualification program approved by the Secretary; or,

(2) He has at least one year 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 noncoal mine, in the mine equipment manufacturing industry, or in any other industry using or manufacturing similar equipment, and has satisfactorily completed a coal mine electrical training program approved by the Secretary; or,

(3) He has at least one year of experience, prior to the date of the application required by paragraph (c) of this section, 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 noncoal mine, in the mine equipment manufacturing industry, or in any other industry using or manufacturing similar equipment, and he attains a satisfactory grade on each of the series of five written tests approved by the Secretary as prescribed in paragraph (b) of this section.

(b) The series of five written tests approved by the Secretary shall include the following categories:

(1) Direct current theory and application;

(2) Alternating current theory and application;

(3) Electric equipment and circuits;

(4) Permissibility of electric equipment; and,

(5) Requirements of Subparts F through J and S of this Part 77.

(c) In order to take the series of five written tests approved by the Secretary, an individual shall apply to the District Manager and shall certify that he meets the requirements of paragraph (a)(3) of this section. The tests will be administered in the Coal Mine Safety and Health Districts at regular intervals, or as demand requires.

(d) A score of at least 80 percent on each of the five written tests will be deemed to be a satisfactory grade. Recognition shall be given to practical experience in that one percentage point shall be added to an individual's score in each test for each additional year of experience beyond the one year requirement specified in paragraph (a)(3) of this section;

however, in no case shall an individual be given more than five percentage points for such practical experience.

(e) An individual may, within 30 days from the date on which he received notification from the Administration of his test scores, repeat those on which he received an unsatisfactory score. If further retesting is necessary after his initial repetition, a minimum of 30 days from the date of receipt of notification of the initial retest scores shall elapse prior to such further retesting.

(f) An individual who has, prior to November 1, 1972, been qualified to perform electrical work specified in Subparts F, G, H, I, and J of this Part 77 (other than work on energized surface high-voltage lines) shall continue to be qualified until June 30, 1973. To remain qualified after June 30, 1973, such individual shall meet the requirements of either paragraph (a) (1), (2), or (3) of this section.

(g) An individual qualified in accordance with this section shall, in order to retain qualification, certify annually to the District Manager, that he has satisfactorily completed a coal mine electrical retraining program approved by the Secretary.

**§ 208.105. Repair of energized surface high-voltage lines; qualified person.**

The provisions of 30 CFR 77.104 (relating to repair of energized surface high-voltage lines; qualified person) are incorporated by reference.

**§ 77.104 Repair of energized surface high-voltage lines; qualified person.**

An individual is a qualified person within the meaning of § 77.704 of this part for the purpose of repairing energized surface high-voltage lines only if he has had at least two years experience in electrical maintenance, and at least two years experience in the repair of energized high-voltage lines located on poles or structures.

**§ 208.106. Qualified hoistman; slope or shaft sinking operation; qualifications.**

The provisions of 30 CFR 77.105 (relating to qualified hoistman; slope or shaft sinking operation; qualifications) are incorporated by reference.

**§ 77.105 Qualified hoistman; slope or shaft sinking operation; qualifications.**

(a)

(1) A person is a qualified hoistman within the provisions of Subpart T of this part, for the purpose of operating a hoist at a slope or shaft sinking operation if he has at least one year experience operating a hoist plant or maintaining hoist equipment and is qualified by any State as a hoistman or its equivalency, or

(2) If a State has no program for qualifying persons as hoistmen, the Secretary may qualify persons if the operator of the slope or shaft-sinking operation makes an application and a satisfactory showing that the person has had one year of experience operating hoists. A person's qualification is valid for as long as the person continues to satisfy the requirements for qualification and is employed at the same coal mine or by the same independent contractor.

**§ 208.107. Records of certified and qualified persons.**

The provisions of 30 CFR 77.106 (relating to records of certified and qualified persons) are incorporated by reference.

**§ 77.106 Records of certified and qualified persons.**

The operator of each coal mine shall maintain a list of all certified and qualified persons designated to perform duties under this Part 77.

**§ 208.108. Training programs.**

The provisions of 30 CFR 77.107 (relating to training programs) are incorporated by reference.

**§ 77.107 Training programs.**

Every operator of a coal mine shall provide a program, approved by the Secretary, of training and retraining both qualified and certified persons needed to carry out functions prescribed in the Act.

## **SURFACE INSTALLATIONS**

**§ 208.111. Surface installations; general.**

The provisions of 30 CFR 77.200 (relating to surface installations; general) are incorporated by reference.

**§ 77.200 Surface installations; general.**

All mine structures, enclosures, or other facilities (including custom coal preparation) shall be maintained in good repair to prevent accidents and injuries to employees.

**§ 208.112. Methane content in surface installations.**

The provisions of 30 CFR 77.201 (relating to methane content in surface installations) are incorporated by reference.

**§ 77.201 Methane content in surface installations.**

The methane content in the air of any structure, enclosure or other facility shall be less than 1.0 volume per centum.

**§ 208.113. Tests for methane; qualified person; use of approved device.**

The provisions of 30 CFR 77.201-1 (relating to tests for methane; qualified person; use of approved device) are incorporated by reference.

**§ 77.201-1 Tests for methane; qualified person; use of approved device.**

Tests for methane in structures, enclosures, or other facilities, in which coal is handled or stored shall be conducted by a qualified person with a device approved by the Secretary at least once during each operating shift, and immediately prior to any repair work in which welding or an open flame is used, or a spark may be produced.

**§ 208.114. Methane accumulations; change in ventilation.**

The provisions of 30 CFR 77.201-2 (relating to methane accumulations; change in ventilation) are incorporated by reference.

**§ 77.201-2 Methane accumulations; change in ventilation.**

If, at any time, the air in any structure, enclosure or other facility contains 1.0 volume per centum or more of methane changes or adjustments in the ventilation of such installation shall be made at once so that the air shall contain less than 1.0 volume per centum of methane.

**§ 208.115. Dust accumulations in surface installations.**

The provisions of 30 CFR 77.202 (relating to dust accumulations in surface installations) are incorporated by reference.

**§ 77.202 Dust accumulations in surface installations.**

Coal dust in the air of, or in, or on the surfaces of, structures, enclosures, or other facilities shall not be allowed to exist or accumulate in dangerous amounts.

**§ 208.116. Use of material or equipment overhead; safeguards.**

The provisions of 30 CFR 77.203 (relating to use of material or equipment overhead; safeguards) are incorporated by reference.

**§ 77.203 Use of material or equipment overhead; safeguards.**

Where overhead repairs are being made at surface installations and equipment or material is taken into such overhead work areas, adequate protection shall be provided for all persons working or passing below the overhead work areas in which such equipment or material is being used.

**§ 208.117. Openings in surface installations; safeguards.**

The provisions of 30 CFR 77.204 (relating to openings in surface installations; safeguards) are incorporated by reference.

**§ 77.204 Openings in surface installations; safeguards.**

Openings in surface installations through which men or material may fall shall be protected by railings, barriers, covers or other protective devices.



**§ 208.118. Travelways at surface installations.**

The provisions of 30 CFR 77.205 (relating to travelways at surface installations) are incorporated by reference.

**§ 77.205 Travelways at surface installations.**

- (a) Safe means of access shall be provided and maintained to all working places.
- (b) Travelways and platforms or other means of access to areas where persons are required to travel or work, shall be kept clear of all extraneous material and other stumbling or slipping hazards.
- (c) Inclined travelways shall be constructed of nonskid material or equipped with cleats.
- (d) Regularly used travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.
- (e) Crossovers, elevated walkways, elevated ramps, and stairways shall be of substantial construction, provided with handrails, and maintained in good condition. Where necessary toeboards shall be provided.
- (f) Crossovers shall be provided where it is necessary to cross conveyors.
- (g) Moving conveyors shall be crossed only at designated crossover points.

**§ 208.119. Ladders; construction; installation and maintenance.**

The provisions of 30 CFR 77.206 (relating to ladders; construction; installation and maintenance) are incorporated by reference.

**§ 77.206 Ladders; construction; installation and maintenance.**

- (a) Ladders shall be of substantial construction and maintained in good condition.
- (b) Wooden members of ladders shall not be painted.
- (c) Steep or vertical ladders which are used regularly at fixed locations shall be anchored securely and provided with backguards extending from a point not more than seven feet from the bottom of the ladder to the top of the ladder.
- (d) Fixed ladders shall not incline backwards at any point unless provided with backguards.
- (e) Fixed ladders shall be anchored securely and installed to provide at least three inches of toe clearance.
- (f) Fixed ladders shall project at least three feet above landings, or substantial handholds shall be provided above the landings.

**§ 208.120. Illumination.**

The provisions of 30 CFR 77.207 (relating to illumination) are incorporated by reference.

**§ 77.207 Illumination.**

Illumination sufficient to provide safe working conditions shall be provided in and on all surface structures, paths, walkways, stairways, switch panels, loading and dumping sites, and working areas.

**§ 208.121. Storage of materials.**

The provisions of 30 CFR 77.208 (relating to storage of materials) are incorporated by reference.

**§ 77.208 Storage of materials.**

- (a) Materials shall be stored and stacked in a manner which minimizes stumbling or fall-of-material hazards.
- (b) Materials that can create hazards if accidentally liberated from their containers shall be stored in a manner that minimizes the dangers.
- (c) Containers holding hazardous materials must be of a type approved for such use by recognized agencies.
- (d) Compressed and liquid gas cylinders shall be secured in a safe manner.
- (e) Valves on compressed gas cylinders shall be protected by covers when being transported or stored, and by a safe location when the cylinders are in use.

**§ 208.122. Surge and storage piles.**

The provisions of 30 CFR 77.209 (relating to surge and storage piles) are incorporated by reference.

**§ 77.209 Surge and storage piles.**

No person shall be permitted to walk or stand immediately above a reclaiming area or in any other area at or near a surge or storage pile where the reclaiming operation may expose him to a hazard.

**§ 208.123. Hoisting of materials.**

The provisions of 30 CFR 77.210 (relating to hoisting of materials) are incorporated by reference.

**§ 77.210 Hoisting of materials.**

- (a) Hitches and slings used to hoist materials shall be suitable for handling the type of materials being hoisted.
- (b) Men shall stay clear of hoisted loads.
- (c) Taglines shall be attached to hoisted materials that require steadying or guidance.

**§ 208.124. Draw-off tunnels; stockpiling and reclaiming operations; general.**

The provisions of 30 CFR 77.211 (relating to draw-off tunnels; stockpiling and reclaiming operations; general) are incorporated by reference.

**§ 77.211 Draw-off tunnels; stockpiling and reclaiming operations; general.**

(a) Tunnels located below stockpiles, surge piles, and coal storage silos shall be ventilated so as to maintain concentrations of methane below 1.0 volume per centum.

(b) In addition to the tests for methane required by § 77.201 such tests shall also be made before any electric equipment is energized or repaired, unless equipped with a continuous methane monitoring device installed and operated in accordance with the provisions of § 77.211-1. Electric equipment shall not be energized, operated, or repaired until the air contains less than 1.0 volume per centum of methane.

**§ 208.125. Continuous methane monitoring device; installation and operation; automatic deenergization of electric equipment.**

The provisions of 30 CFR 77.211-1 (relating to continuous methane monitoring device; installation and operation; automatic deenergization of electric equipment) are incorporated by reference.

**§ 77.211-1 Continuous methane monitoring device; installation and operation; automatic deenergization of electric equipment.**

Continuous methane monitoring devices shall be set to deenergize automatically electric equipment when such monitor is not operating properly and to give a warning automatically when the concentration of methane reaches a maximum percentage determined by an authorized representative of the Secretary which shall not be more than 1.0 volume per centum of methane. An authorized representative of the Secretary shall require such monitor to deenergize automatically electric equipment when the concentration of methane reaches a maximum percentage determined by such representative which shall not be more than 2.0 volume per centum of methane.

**§ 208.126. Draw-off tunnel ventilation fans; installation.**

The provisions of 30 CFR 77.212 (relating to draw-off tunnel ventilation fans; installation) are incorporated by reference.

**§ 77.212 Draw-off tunnel ventilation fans; installation.**

When fans are used to ventilate draw-off tunnels the fans shall be:

(a) Installed on the surface;

- (b) Installed in fireproof housings and connected to the tunnel openings with fireproof air ducts; and,
- (c) Offset from the tunnel opening.

**§ 208.127. Draw-off tunnel escapeways.**

The provisions of 30 CFR 77.213 (relating to draw-off tunnel escapeways) are incorporated by reference.

**§ 77.213 Draw-off tunnel escapeways.**

When it is necessary for a tunnel to be closed at one end, an escapeway not less than 30 inches in diameter (or of the equivalent, if the escapeway does not have a circular cross section) shall be installed which extends from the closed end of the tunnel to a safe location on the surface; and, if the escapeway is inclined more than 30 degrees from the horizontal it shall be equipped with a ladder which runs the full length of the inclined portion of the escapeway.

**THERMAL DRYERS**

**§ 208.131. Thermal dryers; general.**

The provisions of 30 CFR 77.300 (relating to thermal dryers; general) are incorporated by reference.

**§ 77.300 Thermal dryers; general.**

On and after July 1, 1971 dryer systems used for drying coal at high temperatures, hereinafter referred to as thermal dryers, including rotary dryers, continuous carrier dyes, vertical tray, and cascade dryers, multilouver dryers, suspension or flash dryers, and fluidized bed dryers, shall be maintained and operated in accordance with the provision of § 77.301 to § 77.306.

**§ 208.132. Dryer heating units; operation.**

The provisions of 30 CFR 77.301 (relating to dryer heating units; operation) are incorporated by reference.

**§ 77.301 Dryer heating units; operation.**

(a) Dryer heating units shall be operated to provide reasonably complete combustion before heated gases are allowed to enter hot gas inlets.

(b) Dryer heating units which are fired by pulverized coal, shall be operated and maintained in accordance with the recommended standards set forth in the National Fire Protection Association Handbook, 12<sup>th</sup> Edition, Section 9, "Installation of Pulverized Fuel Systems," 1962.

**§ 208.133. Bypass stacks.**

The provisions of 30 CFR 77.302 (relating to bypass stacks) are incorporated by reference.

**§ 77.302 Bypass stacks.**

Thermal dryer systems shall include a bypass stack, relief stack or individual discharge stack provided with automatic venting

which will permit gases from the dryer heating unit to bypass the heating chamber and vent to the outside atmosphere during any shutdown operation.

**§ 208.134. Hot gas inlet chamber dropout doors.**

The provisions of 30 CFR 77.303 (relating to hot gas inlet chamber dropout doors) are incorporated by reference.

**§ 77.303 Hot gas inlet chamber dropout doors.**

Thermal dryer systems which employ a hot gas inlet chamber shall be equipped with drop-out doors at the bottom of the inlet chamber or with other effective means which permit coal, fly-ash, or other heated material to fall from the chamber.

**§ 208.135. Explosion release vents.**

The provisions of 30 CFR 77.304 (relating to explosion release vents) are incorporated by reference.

**§ 77.304 Explosion release vents.**

Drying chambers, dry-dust collectors, ductwork connecting dryers to dust collectors, and ductwork between dust collectors and discharge stacks shall be protected with explosion release vents which open directly to the outside atmosphere, and all such vents shall be:

- (a) Hinged to prevent dislodgment;
- (b) Designed and constructed to permit checking and testing by manual operation; and
- (c) Equal in size to the cross-sectional area of the collector vortex finder when used to vent dry dust collectors.

**§ 208.136. Access to drying chambers, hot gas inlet chambers and duct-work; installation and maintenance.**

The provisions of 30 CFR 77.305 (relating to access to drying chambers, hot gas inlet chambers and ductwork; installation and maintenance) are incorporated by reference.

**§ 77.305 Access to drying chambers, hot gas inlet chambers and ductwork; installation and maintenance.**

Drying chambers, hot gas inlet chambers and all ductwork in which coal dust may accumulate shall be equipped with tight sealing access doors which shall remain latched during dryer operation to prevent the emission of coal dust and the loss of fluidizing air.

**§ 208.137. Fire protection.**

The provisions of 30 CFR 77.306 (relating to fire protection) are incorporated by reference.

**§ 77.306 Fire protection.**

Based on the need for fire protection measures in connection with the particular design of the thermal dryer, an authorized

representative of the Secretary may require any of the following measures to be employed:

(a) Water sprays automatically actuated by rises in temperature to prevent fire, installed inside the thermal dryer systems, and such sprays shall be designed to provide for manual operation in the event of power failure.

(b) Fog nozzles, or other no less effective means, installed inside the thermal dryer systems to provide additional moisture or an artificial drying load within the drying system when the system is being started or shutdown.

(c) The water system of each thermal dryer shall be interconnected to a supply of compressed air which permits constant or frequent purging of all water sprays and fog nozzles or other no less effective means of purging shall be provided.

**§ 208.138. Thermal dryers; location and installation; general.**

The provisions of 30 CFR 77.307 (relating to thermal dryers; location and installation; general) are incorporated by reference.

**§ 77.307 Thermal dryers; location and installation; general.**

(a) Thermal dryer systems erected or installed at any coal mine after June 30, 1971 shall be located at least 100 feet from any underground coal mine opening, and 100 feet from any surface installation where the heat, sparks, flames, or coal dust from the system might cause a fire or explosion.

(b) Thermal dryer systems erected or installed after June 30, 1971 may be covered by roofs, however, such systems shall not be otherwise enclosed unless necessary to protect the health and safety of persons employed at the mine. Where such systems are enclosed, they shall be located in separate fireproof structures of heavy construction with explosion pressure release devices (such as hinged wall panels, window sashes, or louvers); which provide at least one square foot of area for each 80 cubic feet of space volume and which are distributed as uniformly as possible throughout the structure.

**§ 208.139. Structures housing other facilities; use of partitions.**

The provisions of 30 CFR 77.308 (relating to structures housing other facilities; use of partitions) are incorporated by reference.

**§ 77.308 Structures housing other facilities; use of partitions.**

Thermal dryer systems installed after June 30, 1971 in any structure which also houses a tippie, cleaning plant, or other operating facility shall be separated from all other working areas of such structure by a substantial partition capable of providing greater resistance to explosion pressures than the

exterior wall or walls of the structure. The partition shall also include substantial, self-closing fire doors at all entrances to the areas adjoining the dryer system.

**§ 208.140. Visual check of system equipment.**

The provisions of 30 CFR 77.309 (relating to visual check of system equipment) are incorporated by reference.

**§ 77.309 Visual check of system equipment.**

Frequent visual checks shall be made by the operator of the thermal dryer system control station, or by some other competent person, of the bypass dampers, air-tempering louvers, discharge mechanism, and other dryer system equipment.

**§ 208.141. Control stations; location.**

The provisions of 30 CFR 77.309-1 (relating to control stations; location) are incorporated by reference.

**§ 77.309-1 Control stations; location.**

Thermal dryer system control stations constructed after June 30, 1971, shall be installed at a location which will give to the operator of the control station the widest field of visibility of the system and equipment.

**§ 208.142. Control panels.**

The provisions of 30 CFR 77.310 (relating to control panels) are incorporated by reference.

**§ 77.310 Control panels.**

(a) All thermal dryer system control panels constructed after June 30, 1971 shall be located in an area which is relatively free of moisture and dust and shall be installed in such a manner as to minimize vibration.

(b) A schematic diagram containing legends which show the location of each thermocouple, pressure tap, or other control or gaging instrument in the drying system shall be posted on or near the control panel of each thermal drying system.

(c) Each instrument on the control panel shall be identified by a nameplate or equivalent marking.

(d) A plan to control the operation of each thermal dryer system shall be posted at or near the control panel showing a sequence of startup, normal shutdown, and emergency shutdown procedures.

**§ 208.143. Alarm devices.**

The provisions of 30 CFR 77.311 (relating to alarm devices) are incorporated by reference.

**§ 77.311 Alarm devices.**

Thermal dryer systems shall be equipped with both audible and visual alarm devices which are set to operate when safe dryer temperatures are exceeded.

**§ 208.144. Fail safe monitoring systems.**

The provisions of 30 CFR 77.312 (relating to fail-safe monitoring systems) are incorporated by reference.

**§ 77.312 Fail safe monitoring systems.**

Thermal dryer systems and controls shall be protected by a fail-safe monitoring system which will safely shut down the system and any related equipment upon failure of any component in the dryer system.

**§ 208.145. Wet-coal feed bins; low-level indicators.**

The provisions of 30 CFR 77.313 (relating to wet-coal feedbins; low-level indicators) are incorporated by reference.

**§ 77.313 Wet-coal feedbins; low-level indicators.**

Wet-coal bins feeding thermal drying systems shall be equipped with both audible and visual low-coal-level indicators.

**§ 208.146. Automatic temperature control instruments.**

The provisions of 30 CFR 77.314 (relating to automatic temperature control instruments) are incorporated by reference.

**§ 77.314 Automatic temperature control instruments.**

(a) Automatic temperature control instruments for thermal dryer system shall be of the recording type.

(b) Automatic temperature control instruments shall be locked or sealed to prevent tampering or unauthorized adjustment. These instruments shall not be set above the maximum allowable operating temperature.

(c) All dryer control instruments shall be inspected and calibrated at least once every three months and a record or certificate of accuracy, signed by a trained employee or by a servicing agent, shall be kept at the plant.

**§ 208.147. Thermal dryers; examination and inspection.**

The provisions of 30 CFR 77.315 (relating to thermal dryers; examination and inspection) are incorporated by reference.

**§ 77.315 Thermal dryers; examination and inspection.**

Thermal dryer systems shall be examined for fires and coal-dust accumulations if the dryers are not restarted promptly after a shutdown.

**SAFEGUARDS FOR MECHANICAL EQUIPMENT**

**§ 208.151. Mechanical equipment guards.**

The provisions of 30 CFR 77.400 (relating to mechanical equipment guards) are incorporated by reference.

**§ 77.400 Mechanical equipment guards.**

(a) Gears; sprockets; chains; drive, head, tail, and takeup pulleys; flywheels; couplings; shafts; sawblades; fan inlets; and similar exposed moving machine parts which may be contacted



by persons, and which may cause injury to persons shall be guarded.

(b) Overhead belts shall be guarded if the whipping action from a broken line would be hazardous to persons below.

(c) Guards at conveyor-drive, conveyor-head, and conveyor-tail pulleys shall extend a distance sufficient to prevent a person from reaching behind the guard and becoming caught between the belt and the pulley.

(d) Except when testing the machinery, guards shall be securely in place while machinery is being operated.

#### **§ 208.152. Stationary grinding machines; protective devices.**

The provisions of 30 CFR 77.401 (relating to stationary grinding machines; protective devices) are incorporated by reference.

##### **§ 77.401 Stationary grinding machines; protective devices.**

(a) Stationary grinding machines other than special bit grinders shall be equipped with:

(1) Peripheral hoods (less than 90° throat openings) capable of withstanding the force of a bursting wheel.

(2) Adjustable tool rests set as close as practical to the wheel

(3) Safety washers.

(b) Grinding wheels shall be operated within the specifications of the manufacturer of the wheel.

(c) Face shields or goggles, in good condition, shall be worn when operating a grinding wheel.

#### **§ 208.153. Hand-held power tools; safety devices.**

The provisions of 30 CFR 77.402 (relating to hand-held power tools; safety devices) are incorporated by reference.

##### **§ 77.402 Hand-held power tools; safety devices.**

Hand-held power tools shall be equipped with controls requiring constant hand or finger pressure to operate the tools or shall be equipped with friction or other equivalent safety devices.

#### **§ 208.154. Mobile equipment; falling object protective structures.**

The provisions of 30 CFR 77.403 (relating to mobile equipment; falling object protective structures (FOPS)) are incorporated by reference

##### **§ 77.403 Mobile equipment; falling object protective structures (FOPS).**

(a) When necessary to protect the operator of the equipment, all rubber-tired or crawler-mounted self-propelled scrapers, front-end loaders, dozers, graders, loaders, and tractors, with or without attachments, that are used in surface coal mines or the surface work areas of underground coal mines shall be provided with substantial falling object protective structures

(FOPS). FOPS which meet the requirements of the Society of Automotive Engineers (SAE) Standard J 231 shall be considered to be a “substantial” FOPS. An authorized representative of the Secretary may approve a FOPS which provides protection equivalent to SAE J 231.

(b) When necessary to protect the operator of the equipment, forklift or powered industrial trucks shall be provided with substantial FOPS. Such FOPS shall meet the requirements of the State of California, Division of Industrial Safety, General Safety Orders, Register 72, Number 6, February 8, 1972, Article 25, Section 3655—“Overhead Guards for High-Lift Rider Trucks.”

**§ 208.155. Mobile equipment; rollover protective structures.**

All rubber-tired or crawler-mounted self-propelled scrapers front-end loaders, dozers, cranes, loaders and tractors, with or without attachments, at the surface work areas of underground coal mines shall be provided with rollover protective structures, in accordance with the certification requirements approved by MSHA.

**§ 208.156. Seat belts.**

The provisions of 30 CFR 77.403-1(g) (relating to mobile equipment; rollover protective structures (ROPS)) are incorporated by reference.

**§ 77.403-1 Mobile equipment; rollover protective structures (ROPS).**

(a) Seat belts required by § 77.1710(i) shall be worn by the operator of mobile equipment required to be equipped with ROPS by § 77.403-1.

**§ 208.157. Machinery and equipment; operation and maintenance.**

The provisions of 30 CFR 77.404 (relating to machinery and equipment; operation and maintenance) are incorporated by reference.

**§ 77.404 Machinery and equipment; operation and maintenance.**

(a) Mobile and stationary machinery and equipment shall be maintained in safe operating condition and machinery or equipment in unsafe condition shall be removed from service immediately.

(b) Machinery and equipment shall be operated only by persons trained in the use of and authorized to operate such machinery or equipment.

(c) Repairs or maintenance shall not be performed on machinery until the power is off and the machinery is blocked against motion, except where machinery motion is necessary to make adjustments.

(d) Machinery shall not be lubricated while in motion where a hazard exists, unless equipped with extended fittings or cups.

**§ 208.158. Performing work from a raised position; safeguards.**

The provisions of 30 CFR 77.405 (relating to performing work from a raised position; safeguards) are incorporated by reference.

**§ 77.405 Performing work from a raised position; safeguards.**

(a) Men shall not work on or from a piece of mobile equipment in a raised position until it has been blocked in place securely. This does not preclude the use of equipment specifically designed as elevated mobile work platforms.

(b) No work shall be performed under machinery or equipment that has been raised until such machinery or equipment has been securely blocked in position.

**§ 208.159. Drive belts.**

The provisions of 30 CFR 77.406 (relating to drive belts) are incorporated by reference.

**§ 77.406 Drive belts.**

(a) Drive belts shall not be shifted while in motion unless the machines are provided with mechanical shifters.

(b) Belt dressing shall not be applied while belts are in motion except where it can be applied without endangering a person.

**§ 208.160. Power-driven pulleys.**

The provisions of 30 CFR 77.407 (relating to power-driven pulleys) are incorporated by reference

**§ 77.407 Power-driven pulleys.**

(a) Belts, chains, and ropes shall not be guided onto power-driven moving pulleys, sprockets, or drums with the hands except on slow moving equipment especially designed for hand feeding.

(b) Pulleys of conveyors shall not be cleaned manually while the conveyor is in motion.

**§ 208.161. Welding operations.**

The provisions of 30 CFR 77.408 (relating to welding operations) are incorporated by reference.

**§ 77.408 Welding operations.**

Welding operations shall be shielded and the area shall be well-ventilated.

**§ 208.162. Shovels, draglines and tractors.**

The provisions of 30 CFR 77.409 (relating to shovels, draglines, and tractors) are incorporated by reference.

**§ 77.409 Shovels, draglines, and tractors.**

(a) Shovels, draglines, and tractors shall not be operated in the presence of any person exposed to a hazard from its operation and all such equipment shall be provided with an adequate warning device which shall be sounded by the operator prior to starting operation.

(b) Shovels and draglines shall be equipped with handrails along and around all walkways and platforms.

**§ 208.163. Mobile equipment; automatic warning devices.**

The provisions of 30 CFR 77.410 (relating to mobile equipment; automatic warning devices) are incorporated by reference.

**§ 77.410 Mobile equipment; automatic warning devices.**

(a) Mobile equipment such as front-end loaders, forklifts, tractors, graders, and trucks, except pickup trucks with an unobstructed rear view, shall be equipped with a warning device that—

(1) Gives an audible alarm when the equipment is put in reverse; or

(2) Uses infrared light, ultrasonic waves, radar, or other effective devices to detect objects or persons at the rear of the equipment, and sounds an audible alarm when a person or object is detected. This type of discriminating warning device shall—

(i) Have a sensing area of a sufficient size that would allow endangered persons adequate time to get out of the danger zone.

(ii) Give audible and visual alarms inside the operator's compartment and an audible alarm outside of the operator's compartment when a person or object is detected in the sensing area; and

(iii) When the equipment is put in reverse, activate and give a one-time audible and visual alarm inside the operator's compartment and a one-time audible alarm outside the operator's compartment.

(b) Alarms shall be audible above the surrounding noise levels.

(c) Warning devices shall be maintained in functional condition.

(d) An automatic reverse-activated strobe light may be substituted for an audible alarm when mobile equipment is operated at night.

**§ 208.164. Compressed air and boilers; general.**

The provisions of 30 CFR 77.411 (relating to compressed air and boilers; general) are incorporated by reference.

**§ 77.411 Compressed air and boilers; general.**

All boilers and pressure vessels shall be constructed, installed, and maintained in accordance with the standards and

specifications of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

**§ 208.165. Compressed air systems.**

The provisions of 30 CFR 77.412 (relating to compressed air systems) are incorporated by reference.

**§ 77.412 Compressed air systems.**

(a) Compressors and compressed-air receivers shall be equipped with automatic pressure-relief valves, pressure gages, and drain valves.

(b) Repairs involving the pressure system of compressors, receivers, or compressed-air-powered equipment shall not be attempted until the pressure has been relieved from that part of the system to be repaired.

(c) At no time shall compressed air be directed toward a person. When compressed air is used, all necessary precautions shall be taken to protect persons from injury.

(d) Safety chains or suitable locking devices shall be used at connections to machines of high-pressure hose lines of 1-inch inside diameter or larger, and between high-pressure hose lines of 1-inch inside diameter or larger, where a connection failure would create a hazard.

**§ 208.166. Boilers.**

The provisions of 30 CFR 77.413 (relating to boilers) are incorporated by reference.

**§ 77.413 Boilers.**

(a) Boilers shall be equipped with guarded, well-maintained water gages and pressure gages placed so that they can be observed easily. Water gages and pipe passages to the gages shall be kept clean and free of scale and rust.

(b) Boilers shall be equipped with automatic pressure-relief valves; valves shall be opened manually at least once a week to determine that they will function properly.

(c) Blowoff valves shall be piped outside the building and shall have outlets so located or protected that persons passing by, near, or under them will not be scalded.

(d) Boiler installations shall be provided with safety devices, acceptable to the Mine Safety and Health Administration, to protect against hazards of flameouts, fuel interruptions, and low-water level.

(e) Boilers shall be inspected internally at least once a year by a licensed inspector and a certificate of inspection signed by the inspector shall be displayed in the vicinity of the boiler.

## **ELECTRICAL EQUIPMENT—GENERAL**

### **§ 208.171. Electric power circuits and electric equipment; de-energization.**

The provisions of 30 CFR 77.500 (relating to electric power circuits and electric equipment; deenergization) are incorporated by reference.

#### **§ 77.500 Electric power circuits and electric equipment; deenergization.**

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

### **§ 208.172. Electric distribution circuits and equipment; repair.**

The provisions of 30 CFR 77.501 (relating to electric distribution circuits and equipment; repair) are incorporated by reference.

#### **§ 77.501 Electric distribution circuits and equipment; repair.**

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 suitably tagged by such persons. Locks or tags shall be removed only by the persons who installed them or, if such persons are unavailable, by persons authorized by the operator or his agent.

### **§ 208.173. Qualified person.**

The provisions of 30 CFR 77.501-1 (relating to qualified person) are incorporated by reference.

#### **§ 77.501-1 Qualified person.**

A qualified person within the meaning of § 77.501 is an individual who meets the requirements of § 77.103. SEE 208.104.

### **§ 208.174. Electric equipment; examination, testing and maintenance.**

The provisions of 30 CFR 77.502 (relating to electric equipment; examination, testing, and maintenance) are incorporated by reference.

#### **§ 77.502 Electric equipment; examination, testing, and maintenance.**

Electric equipment shall be frequently examined, tested, 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 examinations shall be kept.

**§ 208.175. Qualified person.**

The provisions of 30 CFR 77.502-1 (relating to qualified person) are incorporated by reference.

**§ 77.502-1 Qualified person.**

A qualified person within the meaning of § 77.502 is an individual who meets the requirements of § 77.103. SEE 208.104.

**§ 208.176. Electric equipment; frequency of examination and testing.**

The provisions of 30 CFR 77.502-2 (relating to electric equipment; frequency of examination and testing) are incorporated by reference.

**§ 77.502-2 Electric equipment; frequency of examination and testing.**

The examinations and tests required under the provision of this § 77.502 shall be conducted at least monthly.

**§ 208.177. Electric conductors; capacity and insulation.**

The provisions of 30 CFR 77.503 (relating to electric conductors; capacity and insulation) are incorporated by reference.

**§ 77.503 Electric conductors; capacity and insulation.**

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.

**§ 208.178. Electric conductors.**

The provisions of 30 CFR 77.503-1 (relating to electric conductors) are incorporated by reference.

**§ 77.503-1 Electric conductors.**

Electric conductors shall be sufficient in size to meet the minimum current carrying capacity provided for in the National Electric Code, 1968. All trailing cables shall meet the minimum requirements for ampacity provided in the standards of the Insulated Power Cable Engineers Association—National Electric Manufacturers Association in effect when such cables are purchased.

**§ 208.179. Electrical connections or splices; suitability.**

The provisions of 30 CFR 77.504 (relating to electrical connections or splices; suitability) are incorporated by reference.

**§ 77.504 Electrical connections or splices; suitability.**

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 insulated wire shall be reinsulated at least to the same degree of protection as the remainder of the wire.

**§ 208.180. Cable fittings; suitability.**

The provisions of 30 CFR 77.505 (relating to cable fittings; suitability) are incorporated by reference.

**§ 77.505 Cable fittings; suitability.**

Cables shall enter metal frames of motors, splice boxes, and electric compartments only through proper fittings. When insulated wires, other than cables, pass through metal frames, the holes shall be substantially bushed with insulated bushings.

**§ 208.181. Electric equipment and circuits; overload and short-circuit protection.**

The provisions of 30 CFR 77.506 (relating to electric equipment and circuits; overload and short-circuit protection) are incorporated by reference.

**§ 77.506 Electric equipment and circuits; overload and short-circuit protection.**

Automatic circuit-breaking devices or fuses of the correct type and capacity shall be installed so as to protect all electric equipment and circuits against short circuit and overloads.

**§ 208.182. Electric equipment and circuits; overload and short-circuit protection; minimum requirements.**

The provisions of 30 CFR 77.506-1 (relating to electric equipment and circuits; overload and short circuit protection; minimum requirements) are incorporated by reference.

**§ 77.506-1 Electric equipment and circuits; overload and short circuit protection; minimum requirements.**

Devices providing either short circuit protection or protection against overload shall conform to the minimum requirements for protection of electric circuits and equipment of the National Electric Code, 1968.

**§ 208.183. Electric equipment; switches.**

The provisions of 30 CFR 77.507 (relating to electric equipment; switches) are incorporated by reference

**§ 77.507 Electric equipment; switches.**

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



**§ 208.184. Lightning arresters; ungrounded and exposed power conductors and telephone wires.**

The provisions of 30 CFR 77.508 (relating to lightning arresters, ungrounded and exposed power conductors and telephone wires) are incorporated by reference.

**§ 77.508 Lightning arresters, ungrounded and exposed power conductors and telephone wires.**

All ungrounded, exposed power conductors and telephone wires shall be equipped with suitable lightning arresters which are adequately installed and connected to a low resistance grounding medium.

**§ 208.185. Lightning arresters; wires entering buildings.**

The provisions of 30 CFR 77.508-1 (relating to lightning arresters; wires entering buildings) are incorporated by reference.

**§ 77.508-1 Lightning arresters; wires entering buildings.**

Lightning arresters protecting exposed telephone wires entering buildings shall be provided at the point where each such telephone wire enters the building.

**§ 208.186. Transformers; installation and guarding.**

The provisions of 30 CFR 77.509 (relating to transformers; installation and guarding) are incorporated by reference.

**§ 77.509 Transformers; installation and guarding.**

(a) Transformers shall be of the totally enclosed type, or shall be placed at least eight feet above the ground, or installed in a transformer house, or surrounded by a substantial fence at least six feet high and at least three feet from any energized parts, casings, or wiring.

(b) Transformer stations shall be enclosed to prevent persons from unintentionally or inadvertently contacting energized parts.

(c) Transformer enclosures shall be kept locked against unauthorized entry.

**§ 208.187. Resistors; location and guarding.**

The provisions of 30 CFR 77.510 (relating to resistors; location and guarding) are incorporated by reference.

**§ 77.510 Resistors; location and guarding.**

Resistors, heaters, and rheostats shall be located so as to minimize fire hazards and, where necessary, provided with guards to prevent personal contact.

**§ 208.188. Danger signs at electrical installations.**

The provisions of 30 CFR 77.511 (relating to danger signs at electrical installations) are incorporated by reference.

**§ 77.511 Danger signs at electrical installations.**

Suitable danger signs shall be posted at all major electrical installations.

**§ 208.189. Inspection and cover plates.**

The provisions of 30 CFR 77.512 (relating to inspection and cover plates) are incorporated by reference.

**§ 77.512 Inspection and cover plates.**

Inspection and cover plates on electrical equipment shall be kept in place at all times except during testing or repairs.

**§ 208.190. Insulating mats at power switches.**

The provisions of 30 CFR 77.513 (relating to insulating mats at power switches) are incorporated by reference.

**§ 77.513 Insulating mats at power switches.**

Dry wooden platforms, insulating mats, or other electrically nonconductive material shall be kept in place at all switchboards and power-control switches where shock hazards exist. However, metal plates on which a person normally would stand and which are kept at the same potential as the grounded, metal, non-current-carrying parts of the power switches to be operated may be used.

**§ 208.191. Switchboards; passageways and clearance.**

The provisions of 30 CFR 77.514 (relating to switchboards; passageways and clearance) are incorporated by reference.

**§ 77.514 Switchboards; passageways and clearance.**

Switchboards shall be installed to provide passageways or lanes of travel which permit access to the back of the switchboard from both ends for inspection, adjustment or repair. Openings permitting access to the rear of any switchboard shall be guarded, except where they are located in buildings which are kept locked.

**§ 208.192. Bare signal or control wires; voltage.**

The provisions of 30 CFR 77.515 (relating to bare signal or control wires; voltage) are incorporated by reference.

**§ 77.515 Bare signal or control wires; voltage.**

The voltage on bare signal or control wires accessible to personal contact shall not exceed 40 volts.

**§ 208.193. Electric wiring and equipment; installation and maintenance.**

The provisions of 30 CFR 77.516 (relating to electric wiring and equipment; installation and maintenance) are incorporated by reference.

**§ 77.516 Electric wiring and equipment; installation and maintenance.**

In addition to the requirements of §§ 77.503 and 77.506, all wiring and electrical equipment installed after June 30, 1971, shall meet the requirements of the National Electric Code in effect at the time of installation.

## TRAILING CABLES

### **§ 208.201. Trailing cables; short-circuit protection; disconnecting devices.**

The provisions of 30 CFR 77.600 (relating to trailing cables; short-circuit protection; disconnecting devices) are incorporated by reference.

### **§ 77.600 Trailing cables; short-circuit protection; disconnecting devices.**

Short-circuit protection for trailing cables shall be provided by an automatic circuit breaker or other no less effective device, approved by the Secretary, 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.

### **§ 208.202. Trailing cables or portable cables; temporary splices.**

The provisions of 30 CFR 77.601 (relating to trailing cables or portable cables; temporary splices) are incorporated by reference.

### **§ 77.601 Trailing cables or portable cables; temporary splices.**

Temporary splices in trailing cables or portable cables shall be made in a workmanlike manner and shall be mechanically strong and well insulated. Trailing cables or portable cables with exposed wires or splices that heat or spark under load shall not be used.

### **§ 208.203. Permanent splicing of trailing cables.**

The provisions of 30 CFR 77.602 (relating to permanent splicing of trailing cables) are incorporated by reference.

### **§ 77.602 Permanent splicing of trailing cables.**

When permanent splices in trailing cables are made, they shall be:

- (a) Mechanically strong with adequate electrical conductivity;
- (b) Effectively insulated and sealed so as to exclude moisture; and,
- (c) Vulcanized or otherwise made with suitable materials to provide good bonding to the outer jacket.

### **§ 208.204. Clamping of trailing cables to equipment.**

The provisions of 30 CFR 77.603 (relating to clamping of trailing cables to equipment) are incorporated by reference.

### **§ 77.603 Clamping of trailing cables to equipment.**

Trailing cables shall be clamped to machines in a manner to protect the cables from damage and to prevent strain on the electrical connections.

**§ 208.205. Protection of trailing cables.**

The provisions of 30 CFR 77.604 (relating to protection of trailing cables) are incorporated by reference.

**§ 77.604 Protection of trailing cables.**

Trailing cables shall be adequately protected to prevent damage by mobile equipment.

**§ 208.206. Breaking trailing cable and power cable connections.**

The provisions of 30 CFR 77.605 (relating to breaking trailing cable and power cable connections) are incorporated by reference.

**§ 77.605 Breaking trailing cable and power cable connections.**

Trailing cable and power cable connections between cables and to power sources shall not be made or broken under load.

**§ 208.207. Energized trailing cables; handling.**

The provisions of 30 CFR 77.606 (relating to energized trailing cables; handling) are incorporated by reference.

**§ 77.606 Energized trailing cables; handling.**

Energized medium- and high-voltage trailing cables shall be handled only by persons wearing protective rubber gloves (see § 77.606-1) and, with such other protective devices as may be necessary and appropriate under the circumstances.

**§ 208.208. Rubber gloves; minimum requirements.**

The provisions of 30 CFR 77.606-1 (relating to rubber gloves; minimum requirements) are incorporated by reference.

**§ 77.606-1 Rubber gloves; minimum requirements.**

(a) Rubber gloves (lineman's gloves) worn while handling high-voltage trailing cables shall be rated at least 20,000 volts and shall be used and tested in accordance with the provisions of §§ 77.704-6 through 77.704-8.

(b) Rubber gloves (wireman's gloves) worn while handling trailing cables energized by 660 to 1,000 volts shall be rated at least 1,000 volts and shall not be worn inside out or without protective leather gloves.

(c) Rubber gloves shall be inspected for defects before use on each shift and at least once thereafter during the shift when such rubber gloves are used for extended periods. All protective rubber gloves which contain defects shall be discarded and replaced prior to handling energized cables.

## **GROUNDING**

### **§ 208.211. Grounding metallic sheaths, armors and conduits enclosing power conductors.**

The provisions of 30 CFR 77.700 (relating to grounding metallic sheaths, armors, and conduits enclosing power conductors) are incorporated by reference.

### **§ 77.700 Grounding metallic sheaths, armors, and conduits enclosing power conductors.**

Metallic sheaths, armors, and conduits enclosing power conductors shall be electrically continuous throughout and shall be grounded by methods approved by an authorized representative of the Secretary.

### **§ 208.212. Approved methods of grounding.**

The provisions of 30 CFR 77.700-1 (relating to approved methods of grounding) are incorporated by reference.

### **§ 77.700-1 Approved methods of grounding.**

Metallic sheaths, armors, and conduits in resistance grounded systems, where the enclosed conductors are a part of the system, will be approved if a solid connection is made to the neutral conductor; in all other systems, the following methods of grounding will be approved:

- (a) A solid connection to metal waterlines having low resistance to earth;
- (b) A solid connection to a grounding conductor, other than the neutral conductor of a resistance grounded system, extending to a low-resistance ground field;
- (c) Any other method of grounding, approved by an authorized representative of the Secretary, which ensures that there is no difference in potential between such metallic enclosures and the earth.

### **§ 208.213. Grounding metallic frames, casings and other enclosures of electric equipment.**

The provisions of 30 CFR 77.701 (relating to grounding metallic frames, casings, and other enclosures of electric equipment) are incorporated by reference.

### **§ 77.701 Grounding metallic frames, casings, and other enclosures of electric equipment.**

Metallic frames, casings, and other enclosures of electric equipment that can become “alive” through failure of insulation or by contact with energized parts shall be grounded by methods approved by an authorized representative of the Secretary.

**§ 208.214. Approved methods of grounding of equipment receiving power from ungrounded alternating current power systems.**

The provisions of 30 CFR 77.701-1 (relating to approved methods of grounding of equipment receiving power from ungrounded alternating current power systems) are incorporated by reference.

**§ 77.701-1 Approved methods of grounding of equipment receiving power from ungrounded alternating current power systems.**

For purposes of grounding metallic frames, casings and other enclosures of equipment receiving power from ungrounded alternating current power systems, the following methods of grounding will be approved:

- (a) A solid connection between the metallic frame; casing, or other metal enclosure and the grounded metallic sheath, armor, or conduit enclosing the power conductor feeding the electric equipment enclosed;
- (b) A solid connection to metal waterlines having low resistance to earth;
- (c) A solid connection to a grounding conductor extending to a low-resistance ground field; and,
- (d) Any other method of grounding, approved by an authorized representative of the Secretary, which insures that there is no difference in potential between such metal enclosures and the earth.

**§ 208.215. Approved methods of grounding metallic frames, casings and other enclosures of electric equipment receiving power from a direct-current power system.**

The provisions of 30 CFR 77.701-2 (relating to approved methods of grounding metallic frames, casings, and other enclosures of electric equipment receiving power from a direct-current power system) are incorporated by reference.

**§ 77.701-2 Approved methods of grounding metallic frames, casings, and other enclosures of electric equipment receiving power from a direct-current power system.**

- (a) The following methods of grounding metallic frames, casings, and other enclosures of electric equipment receiving power from a direct-current power system with one polarity grounded will be approved:
  - (1) A solid connection to the grounded power conductor of the system; and,
  - (2) Any other method, approved by an authorized representative of the Secretary, which insures that there is no difference in potential between such metal enclosures and the earth.
- (b) A method of grounding of metallic frames, casings, and other enclosures of electric equipment receiving power from a direct-current power system other than a system with one

polarity grounded, will be approved by an authorized representative of the Secretary if the method insures that there is no difference in potential between such frames, casings, and other enclosures, and the earth.

**§ 208.216. Grounding wires; capacity.**

The provisions of 30 CFR 77.701-3 (relating to grounding wires; capacity) are incorporated by reference.

**§ 77.701-3 Grounding wires; capacity.**

Where grounding wires are used to ground metallic sheaths, armors, conduits, frames, casings, and other metallic enclosures, such grounding wires will be approved if:

(a) Where the power conductor used is No. 6 A.W.G., or larger, the cross-sectional area of the grounding wire is at least one-half the cross-sectional area of the power conductor.

(b) Where the power conductor used is less than No. 6 A.W.G., the cross-sectional area of the grounding wire is equal to the cross-sectional area of the power conductor.

**§ 208.217. Use of grounding connectors.**

The provisions of 30 CFR 77.701-4 (relating to use of grounding connectors) are incorporated by reference.

**§ 77.701-4 Use of grounding connectors.**

If ground wires are attached to grounded power conductors, separate clamps, suitable for such purpose, shall be used and installed to provide a solid connection.

**§ 208.218. Protection other than grounding.**

The provisions of 30 CFR 77.702 (relating to protection other than grounding) are incorporated by reference.

**§ 77.702 Protection other than grounding.**

Methods other than grounding which provide no less effective protection may be permitted by the Secretary or his authorized representative. Such methods may not be used unless so approved.

**§ 208.219. Grounding frames of stationary high-voltage equipment receiving power from ungrounded delta systems.**

The provisions of 30 CFR 77.703 (relating to grounding frames of stationary high-voltage equipment receiving power from ungrounded delta systems) are incorporated by reference.

**§ 77.703 Grounding frames of stationary high-voltage equipment receiving power from ungrounded delta systems.**

The frames of all stationary high-voltage equipment receiving power from ungrounded delta systems shall be grounded by methods approved by an authorized representative of the Secretary.

**§ 208.220. Approved methods of grounding.**

The provisions of 30 CFR 77.703-1 (relating to approved methods of grounding) are incorporated by reference.

**77.703-1 Approved methods of grounding.**

The methods of grounding stated in § 77.701-1 will be approved with respect to the grounding of frames of high-voltage equipment referred to in § 77.703.

**§ 208.221. Work on high-voltage lines; de-energizing and grounding.**

The provisions of 30 CFR 77.704 (relating to work on high-voltage lines; deenergizing and grounding) are incorporated by reference.

**§ 77.704 Work on high-voltage lines; deenergizing and grounding.**

High-voltage lines shall be deenergized and grounded before work is performed on them, except that repairs may be permitted on energized high-voltage lines if (a) such repairs are made by a qualified person in accordance with procedures and safeguards set forth in §§ 77.704–1 through 77.704–11 of this Subpart H as applicable, and (b) the operator has tested and properly maintained the protective devices necessary in making such repairs.

**§ 208.222. Work on high-voltage lines.**

The provisions of 30 CFR 77.704-1 (relating to work on high-voltage lines) are incorporated by reference.

**§ 77.704-1 Work on high-voltage lines.**

(a) No high-voltage line shall be regarded as deenergized for the purpose of performing work on it, until it has been determined by a qualified person (as provided in § 77.103) that such high-voltage line has been deenergized and grounded. Such qualified person shall by visual observation:

- (1) determine that the disconnecting devices on the high-voltage circuit are in open position, and
- (2) insure that each ungrounded conductor of the high-voltage circuit upon which work is to be done is properly connected to the system grounding medium. In the case of resistance grounded or solid wye-connected systems, the neutral wire is the system grounding medium. In the case of an ungrounded power system, either the steel armor or conduit enclosing the system, or a surface grounding field is a system grounding medium;

(b) No work shall be performed on any high-voltage line which is supported by any pole or structure which also supports other high-voltage lines until:

- (1) All lines supported on the pole or structure are deenergized and grounded in accordance with all of the provisions of this § 77.704–1 which apply to the repair of deenergized surface high-voltage lines; or



- (2) the provisions of §§ 77.704–2 through 77.704–10 have been complied with, with respect to all energized lines, which are supported on the pole or structure.
- (c) Work may be performed on energized surface high-voltage lines only in accordance with the provisions of §§ 77.704–2 through 77.704–10, inclusive.

**§ 208.223. Repairs to energized high-voltage lines.**

The provisions of 30 CFR 77.704-2 (relating to repairs to energized high-voltage lines) are incorporated by reference.

**§ 77.704-2 Repairs to energized high-voltage lines.**

An energized high-voltage line may be repaired only when:

- (a) The operator has determined that,
- (1) Such repairs cannot be scheduled during a period when the power circuit could be properly deenergized and grounded;
  - (2) Such repairs will be performed on power circuits with a phase-to-phase nominal voltage no greater than 15,000 volts;
  - (3) Such repairs on circuits with a phase-to-phase nominal voltage of 5,000 volts or more will be performed only with the use of live line tools; and,
  - (4) Weather conditions will not interfere with such repairs or expose those persons assigned to such work to an imminent danger; and,
- (b) The operator has designated a person qualified under the provisions of § 77.104 as the person responsible for carrying out such repairs and such person, in order to ensure protection for himself and other qualified persons assigned to perform such repairs from the hazards of such repair, has prepared and filed with the operator:
- (1) A general description of the nature and location of the damage or defect to be repaired;
  - (2) The general plan to be followed in making such repairs;
  - (3) A statement that a briefing of all qualified persons assigned to make such repairs was conducted informing them of the general plan, their individual assignments, and the dangers inherent in such assignments;
  - (4) A list of the proper protective equipment and clothing that will be provided; and
  - (5) Such other information as the person designated by the operator feels necessary to describe properly the means or methods to be employed in such repairs.

**§ 208.224. Work on energized high-voltage surface lines; reporting.**

The provisions of 30 CFR 77.704-3 (relating to work on energized high-voltage surface lines; reporting) are incorporated by reference.

**§ 77.704-3 Work on energized high-voltage surface lines; reporting.**

Any operator designating and assigning qualified persons to perform repairs on energized high-voltage surface lines under the provisions of § 77.704-2 shall maintain a record of such repairs. Such record shall contain a notation of the time, date, location, and general nature of the repairs made together with a copy of the information filed with the operator by the qualified person designated as responsible for performing such repairs.

**§ 208.225. Simultaneous repairs.**

The provisions of 30 CFR 77.704-4 (relating to simultaneous repairs) are incorporated by reference.

**§ 77.704-4 Simultaneous repairs.**

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

**§ 208.226. Installation of protective equipment.**

The provisions of 30 CFR 77.704-5 (relating to installation of protective equipment) are incorporated by reference.

**§ 77.704-5 Installation of protective equipment.**

Before repair work on energized high-voltage surface lines is begun, protective equipment shall be used to cover all bare conductors, ground wires, guys, telephone lines, and other attachments in proximity to the area of planned repairs. Such protective equipment shall be installed from a safe position below the conductors or other apparatus being covered. Each rubber protective device employed in the making of repairs shall have a dielectric strength of 20,000 volts, or more.

**§ 208.227. Protective clothing; use and inspection.**

The provisions of 30 CFR 77.704-6 (relating to protective clothing; use and inspection) are incorporated by reference.

**§ 77.704-6 Protective clothing; use and inspection.**

All persons performing work on energized high-voltage surface lines shall wear protective rubber lineman's gloves, sleeves, and climber guards if climbers are worn. Protective rubber gloves shall not be worn wrong side out or without protective leather gloves. Protective devices worn by a person assigned to perform repairs on high-voltage surface lines shall be worn continuously from the time he leaves the ground until he returns to the ground and, if such devices are employed for extended periods, such person shall visually inspect the equipment assigned him for defects before each use and, in no case, less than twice each day.

**§ 208.228. Protective equipment; inspection.**

The provisions of 30 CFR 77.704-7 (relating to protective equipment; inspection) are incorporated by reference.

**§ 77.704-7 Protective equipment; inspection.**

Each person shall visually inspect protective equipment and clothing provided him in connection with work on high-voltage surface lines before using such equipment and clothing, and any equipment or clothing containing any defect or damage shall be discarded and replaced with proper protective equipment or clothing prior to the performance of any electrical work on such lines.

**§ 208.229. Protective equipment; testing and storage.**

The provisions of 30 CFR 77.704-8 (relating to protective equipment; testing and storage) are incorporated by reference.

**§ 77.704-8 Protective equipment; testing and storage.**

(a) All rubber protective equipment used on work on energized high-voltage surface lines shall be electrically tested by the operator in accordance with ASTM standards, Part 28, published February 1968, and such testing shall be conducted in accordance with the following schedule:

- (1) Rubber gloves, once each month;
- (2) Rubber sleeves, once every three months;
- (3) Rubber blankets, once every six months;
- (4) Insulator hoods and line hose, once a year; and
- (5) Other electric protective equipment, once a year.

(b) Rubber gloves shall not be stored wrong side out. Blankets shall be rolled when not in use, and line hose, and insulator hoods shall be stored in their natural position and shape.

**§ 208.230. Operating disconnecting or cutout switches.**

The provisions of 30 CFR 77.704-9 (relating to operating disconnecting or cutout switches) are incorporated by reference.

**§ 77.704-9 Operating disconnecting or cutout switches.**

Disconnecting or cutout switches on energized high-voltage surface lines shall be operated only with insulated sticks, fuse tongs, or pullers which are adequately insulated and maintained to protect the operator from the voltage to which he is exposed. When such switches are operated from the ground, the person using such devices shall wear protective rubber lineman's gloves, except where such switches are bonded to a metal mat as provided in § 77.513.

**§ 208.231. Tying into energized high-voltage surface circuits.**

The provisions of 30 CFR 77.704-10 (relating to tying into energized high-voltage surface circuits) are incorporated by reference.

**§ 77.704-10 Tying into energized high-voltage surface circuits.**

If the work of forming an additional circuit by tying into an energized high-voltage surface line is performed from the ground, any person performing such work must wear and employ all of the protective equipment and clothing required under the provisions of §§ 77.704-5 and 77.704-6. In addition, the insulated stick used by such person must have been designed for such purpose and must be adequately insulated and be maintained to protect such person from the voltage to which he is exposed.

**§ 208.232. Use of grounded messenger wires; ungrounded systems.**

The provisions of 30 CFR 77.704-11 (relating to use of grounded messenger wires; ungrounded systems) are incorporated by reference.

**§ 77.704-11 Use of grounded messenger wires; ungrounded systems.**

Solely for purposes of grounding ungrounded high-voltage power systems, grounded messenger wires used to suspend the cables of such systems may be used as a grounding medium.

**§ 208.233. Guy wires; grounding.**

The provisions of 30 CFR 77.705 (relating to guy wires; grounding) are incorporated by reference.

**§ 77.705 Guy wires; grounding.**

Guy wires from poles supporting high-voltage transmission lines shall be securely connected to the system ground or be provided with insulators installed near the pole end.

**SURFACE HIGH-VOLTAGE DISTRIBUTION**

**§ 208.241. High-voltage circuits; circuit breakers.**

The provisions of 30 CFR 77.800 (relating to high-voltage circuits; circuit breakers) are incorporated by reference.

**§ 77.800 High-voltage circuits; circuit breakers.**

High-voltage circuits supplying power to portable or mobile equipment shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained and equipped with devices to provide protection against under voltage, grounded phase, short circuit and overcurrent. High-voltage circuits supplying power to stationary equipment shall be protected against overloads by either a circuit breaker or fuses of the correct type and capacity.

**§ 208.242. Testing, examination and maintenance of circuit breakers; procedures.**

The provisions of 30 CFR 77.800-1 (relating to testing, examination, and maintenance of circuit breakers; procedures) are incorporated by reference.

**§ 77.800-1 Testing, examination, and maintenance of circuit breakers; procedures.**

(a) Circuit breakers and their auxiliary devices protecting high-voltage circuits to portable or mobile equipment shall be tested and examined at least once each month by a person qualified as provided in § 77.103.

(b) Tests shall include:

(1) Breaking continuity of the ground check conductor where ground check monitoring is used; and,

(2) Actuating any of the auxiliary protective relays.

(c) Examination shall include visual observation of all components of the circuit breaker and its auxiliary devices, and such repairs or adjustments as are indicated by such tests and examinations shall be carried out immediately.

**§ 208.243. Testing, examination and maintenance of circuit breakers; record.**

The provisions of 30 CFR 77.800-2 (relating to testing, examination, and maintenance of circuit breakers; record) are incorporated by reference.

**§ 77.800-2 Testing, examination, and maintenance of circuit breakers; record.**

The operator shall maintain a written record of each test, examination, repair, or adjustment of all circuit breakers protecting high-voltage circuits. Such record shall be kept in a book approved by the Secretary.

**§ 208.244. Grounding resistors.**

The provisions of 30 CFR 77.801 (relating to grounding resistors) are incorporated by reference.

**§ 77.801 Grounding resistors.**

The grounding resistor, where required, shall be of the proper ohmic value to limit the voltage drop in the grounding circuit external to the resistor to not more than 100 volts under fault conditions. The grounding resistor shall be rated for maximum fault current continuously and insulated from ground for a voltage equal to the phase-to-phase voltage of the system.

**§ 208.245. Grounding resistors; continuous current rating.**

The provisions of 30 CFR 77.801-1 (relating to grounding resistors; continuous current rating) are incorporated by reference.

**§ 77.801-1 Grounding resistors; continuous current rating.**  
The ground fault current rating of grounding resistors shall meet the “extended time rating” set forth in American Institute of Electrical Engineers, Standard No. 32.

**§ 208.246. Protection of high-voltage circuits; neutral grounding resistors; disconnecting devices.**

The provisions of 30 CFR 77.802 (relating to protection of high-voltage circuits; neutral grounding resistors; disconnecting devices) are incorporated by reference.

**§ 77.802 Protection of high-voltage circuits; neutral grounding resistors; disconnecting devices.**

High-voltage circuits supplying portable or mobile equipment shall contain either a direct or derived neutral which shall be grounded through a suitable resistor at the source transformers, and a grounding circuit, originating at the grounded side of the grounding resistor, shall extend along with the power conductors and serve as a grounding conductor for the frames of all high-voltage equipment supplied power from that circuit, except that the Secretary or his authorized representative may permit other high-voltage circuits to feed stationary electrical equipment, if he finds that such exception will not pose a hazard to the miners. Disconnecting devices shall be installed and so equipped or designed in such a manner that it can be determined by visual observation that the power is disconnected.

**§ 208.247. Fail safe ground check circuits on high-voltage resistance grounded systems.**

The provisions of 30 CFR 77.803 (relating to fail safe ground check circuits on high-voltage resistance grounded systems) are incorporated by reference.

**§ 77.803 Fail safe ground check circuits on high-voltage resistance grounded systems.**

On and after September 30, 1971, all high-voltage, resistance grounded systems shall include a fail safe ground check circuit or other no less effective device approved by the Secretary to monitor continuously the grounding circuit to assure continuity. The fail safe ground check circuit shall cause the circuit breaker to open when either the ground or ground check wire is broken.

**§ 208.248. Fail safe ground check circuits; maximum voltage.**

The provisions of 30 CFR 77.803-1 (relating to fail safe ground check circuits; maximum voltage) are incorporated by reference.

**§ 77.803-1 Fail safe ground check circuits; maximum voltage.**

The maximum voltage used for ground check circuits under § 77.803 shall not exceed 96 volts.

**§ 208.249. Ground check systems not employing pilot check wires; approval by the Secretary of the United States Department of Labor.**

The provisions of 30 CFR 77.803-2 (relating to ground check systems not employing pilot check wires; approval by the Secretary) are incorporated by reference.

**§ 77.803-2 Ground check systems not employing pilot check wires; approval by the Secretary.**

Ground check systems not employing pilot check wires shall be approved by the Secretary only if it is determined that the system includes a fail-safe design which will cause the circuit interrupter to open when ground continuity is broken.

**§ 208.250. High-voltage trailing cables; minimum design requirements.**

The provisions of 30 CFR 77.804 (relating to high-voltage trailing cables; minimum design requirements) are incorporated by reference.

**§ 77.804 High-voltage trailing cables; minimum design requirements.**

(a) High-voltage trailing cables used in resistance grounded systems shall be equipped with metallic shields around each power conductor with one or more ground conductors having a total cross-sectional area of not less than one-half the power conductor, and with an insulated conductor for the ground continuity check circuit. External ground check conductors may be used if they are not smaller than No. 8 (AWG) and have an insulation rated at least 600 volts.

(b) All such high-voltage trailing cables shall be adequate for the intended current and voltage. Splices made in such cables shall provide continuity of all components.

**§ 208.251. Cable couplers and connection boxes; minimum design requirements.**

The provisions of 30 CFR 77.805 (relating to cable couplers and connection boxes; minimum design requirements) are incorporated by reference.

**§ 77.805 Cable couplers and connection boxes; minimum design requirements.**

(a)

(1) Couplers that are used in medium or high-voltage power circuits shall be of the three-phase type and enclosed in a full metallic shell, except that the Secretary may permit, under such guidelines as he may prescribe, no less effective couplers constructed of materials other than metal.

(2) Cable couplers shall be adequate for the intended current and voltage.

(3) Cable couplers with any metal exposed shall be grounded to the ground conductor in the cable.

(4) Couplers shall be constructed to cause the ground check continuity conductor to break first and the ground conductor last when being uncoupled when pilot check circuits are used.

(b) Cable connection boxes shall be of substantial construction and designed to guard all energized parts from personal contact.

**§ 208.252. Connection of single-phase loads.**

The provisions of 30 CFR 77.806 (relating to connection of single-phase loads) are incorporated by reference.

**§ 77.806 Connection of single-phase loads.**

Single-phase loads, such as transformer primaries, shall be connected phase to phase in resistance grounded systems.

**§ 208.253. Installation of high-voltage transmission cables.**

The provisions of 30 CFR 77.807 (relating to installation of high-voltage transmission cables) are incorporated by reference.

**§ 77.807 Installation of high-voltage transmission cables.**

High-voltage transmission cables shall be installed or placed so as to afford protection against damage. They shall be placed to prevent contact with low-voltage or communication circuits.

**§ 208.254. High-voltage powerlines; clearances above ground.**

The provisions of 30 CFR 77.807-1 (relating to high-voltage powerlines; clearances above ground) are incorporated by reference.

**§ 77.807-1 High-voltage powerlines; clearances above ground.**

High-voltage powerlines located above driveways, haulage ways, and railroad tracks shall be installed to provide the minimum vertical clearance specified in National Electrical Safety Code: Provided, however, That in no event shall any high-voltage powerline be installed less than 15 feet above ground.

**§ 208.255. Booms and masts; minimum distance from high-voltage lines.**

The provisions of 30 CFR 77.807-2 (relating to booms and masts; minimum distance from high-voltage lines) are incorporated by reference.



**§ 77.807-2 Booms and masts; minimum distance from high-voltage lines.**

The booms and masts of equipment operated on the surface of any coal mine 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:

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

**§ 208.256. Movement of equipment; minimum distance from high-voltage lines.**

The provisions of 30 CFR 77.807-3 (relating to movement of equipment; minimum distance from high-voltage lines) are incorporated by reference.

**§ 77.807-3 Movement of equipment; minimum distance from high-voltage lines.**

When any part of any equipment operated on the surface of any coal mine is required to pass under or by any energized high-voltage powerline and the clearance between such equipment and powerline is less than that specified in § 77.807-2 for booms and masts, such powerlines shall be deenergized or other precautions shall be taken.

**§ 208.257. Disconnecting devices.**

The provisions of 30 CFR 77.808 (relating to disconnecting devices) are incorporated by reference.

**§ 77.808 Disconnecting devices.**

Disconnecting devices shall be installed at the beginning of each branch line in high-voltage circuits and they shall be equipped or designed in such a manner that it can be determined by visual observation that the circuit is deenergized when such devices are open.

**§ 208.258. Identification of circuit breakers and disconnecting switches.**

The provisions of 30 CFR 77.809 (relating to identification of circuit breakers and disconnecting switches) are incorporated by reference.

**§ 77.809 Identification of circuit breakers and disconnecting switches.**

Circuit breakers and disconnecting switches shall be labeled to show which units they control, unless identification can be made readily by location.

**§ 208.259. High-voltage equipment; grounding.**

The provisions of 30 CFR 77.810 (relating to high-voltage equipment; grounding) are incorporated by reference.

**§ 77.810 High-voltage equipment; grounding.**

Frames, supporting structures, and enclosures of stationary, portable, or mobile high-voltage equipment shall be effectively grounded.

**§ 208.260. Movement of portable substations and transformers.**

The provisions of 30 CFR 77.811 (relating to movement of portable substations and transformers) are incorporated by reference.

**§ 77.811 Movement of portable substations and transformers.**

Portable substations and transformers shall be deenergized before they are moved from one location to another.

**LOW-VOLTAGE AND MEDIUM-VOLTAGE  
ALTERNATING CURRENT**

**§ 208.271. Low-voltage and medium-voltage circuits serving portable or mobile three-phase alternating current equipment; circuit breakers.**

The provisions of 30 CFR 77.900 (relating to low and medium-voltage circuits serving portable or mobile three-phase alternating current equipment; circuit breakers) are incorporated by reference.

**§ 77.900 Low- and medium-voltage circuits serving portable or mobile three-phase alternating current equipment; circuit breakers.**

Low and medium-voltage circuits supplying power to portable or mobile three-phase alternating current equipment shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained and equipped with devices to provide protection against undervoltage, grounded phase, short circuit, and over-current.

**§ 208.272. Testing, examination and maintenance of circuit breakers; procedures.**

The provisions of 30 CFR 77.900-1 (relating to testing, examination, and maintenance of circuit breakers; procedures) are incorporated by reference.

**§ 77.900-1 Testing, examination, and maintenance of circuit breakers; procedures.**

Circuit breakers protecting low and medium-voltage circuits serving portable or mobile three-phase alternating current equipment and their auxiliary devices shall be tested and examined at least once each month by a person qualified as provided in § 77.103. In performing such tests, the circuit breaker auxiliaries or control circuits shall be actuated in any manner which causes the circuit breaker to open. All components of the circuit breaker and its auxiliary devices shall be visually examined and such repairs or adjustments as are indicated by such tests and examinations shall be carried out immediately.

**§ 208.273. Testing, examination and maintenance of circuit breakers; record.**

The provisions of 30 CFR 77.900-2 (relating to testing, examination, and maintenance of circuit breakers; record) are incorporated by reference.

**§ 77.900-2 Testing, examination, and maintenance of circuit breakers; record.**

The operator shall maintain a written record of each test, examination, repair, or adjustment of all circuit breakers protecting low and medium-voltage circuits serving three-phase alternating current equipment and such record shall be kept in a book approved by the Secretary.

**§ 208.274. Protection of low-voltage and medium-voltage three-phase circuits.**

The provisions of 30 CFR 77.901 (relating to protection of low and medium-voltage three-phase circuits) are incorporated by reference.

**§77.901 Protection of low- and medium-voltage three-phase circuits.**

(a) Low and medium-voltage circuits supplying power to portable or mobile three-phase alternating equipment shall contain:

- (1) Either a direct or derived neutral grounded through a suitable resistor at the power source;
- (2) A grounding circuit originating at the grounded side of the grounding resistor which extends along with the power conductors and serves as a grounding conductor for the frames of all the electric equipment supplied power from the circuit.

(b) Grounding resistors, where required, shall be of an ohmic value which limits the ground fault current to no more than 25 amperes. Such grounding resistors shall be rated for maximum fault current continuously and provide insulation from ground for a voltage equal to the phase-to-phase voltage of the system.

(c) Low and medium-voltage circuits supplying power to three-phase alternating current stationary electric equipment shall comply with the National Electric Code.

**§ 208.275. Grounding resistor; continuous current rating.**

The provisions of 30 CFR 77.901-1 (relating to grounding resistor; continuous current rating) are incorporated by reference.

**§ 77.901-1 Grounding resistor; continuous current rating.**

The ground fault current rating of grounding resistors shall meet the “extended time rating” set forth in American Institute of Electrical Engineers Standard No. 32.

**§ 208.276. Low-voltage and medium-voltage ground check monitor circuits.**

The provisions of 30 CFR 77.902 (relating to low and medium-voltage ground check monitor circuits) are incorporated by reference.

**§ 77.902 Low- and medium-voltage ground check monitor circuits.**

On and after September 30, 1971, three-phase low and medium-voltage resistance grounded systems to portable and mobile equipment shall include a fail safe ground check circuit or other no less effective device approved by the Secretary to monitor continuously the grounding circuit to assure continuity. The fail safe ground check circuit shall cause the circuit breaker to open when either the ground or pilot check wire is broken. Cable couplers shall be constructed to cause the ground check continuity conductor to break first and the ground conductor last when being uncoupled when pilot check circuits are used.

**§ 208.277. Fail safe ground check circuits; maximum voltage.**

The provisions of 30 CFR 77.902-1 (relating to fail safe ground check circuits; maximum voltage) are incorporated by reference.

**§ 77.902-1 Fail safe ground check circuits; maximum voltage.**

The maximum voltage used for ground check circuits under § 77.902 shall not exceed 40 volts.

**§ 208.278. Approved ground check systems not employing pilot check wires.**

The provisions of 30 CFR 77.902-2 (relating to approved ground check systems not employing pilot check wires) are incorporated by reference.

**§ 77.902-2 Approved ground check systems not employing pilot check wires.**

Ground check systems not employing pilot check wires shall be approved by the Secretary only after it has been determined that the system includes a fail safe design causing the circuit breaker to open when ground continuity is broken.

**§ 208.279. Attachment of ground conductors and ground check wires to equipment frames; use of separate connections.**

The provisions of 30 CFR 77.902-3 (relating to attachment of ground conductors and ground check wires to equipment frames; use of separate connections) are incorporated by reference.

**§ 77.902-3 Attachment of ground conductors and ground check wires to equipment frames; use of separate connections.**

In grounding the frames of stationary, portable, or mobile equipment receiving power from resistance grounded systems, separate connections shall be used.

**§ 208.280. Disconnecting devices.**

The provisions of 30 CFR 77.903 (relating to disconnecting devices) are incorporated by reference.

**§ 77.903 Disconnecting devices.**

Disconnecting devices shall be installed in circuits supplying power to portable or mobile equipment and shall provide visual evidence that the power is disconnected.

**§ 208.281. Identification of circuit breakers.**

The provisions of 30 CFR 77.904 (relating to identification of circuit breakers) are incorporated by reference.

**§ 77.904 Identification of circuit breakers.**

Circuit breakers shall be labeled to show which circuits they control unless identification can be made readily by location.

**§ 208.282. Connection of single-phase loads.**

The provisions of 30 CFR 77.905 (relating to connection of single-phase loads) are incorporated by reference.

**§ 77.905 Connection of single-phase loads.**

Single-phase loads shall be connected phase-to-phase in resistance grounded systems.

**§ 208.283. Trailing cables supplying power to low-voltage mobile equipment; ground wires and ground check wires.**

The provisions of 30 CFR 77.906 (relating to trailing cables supplying power to low-voltage mobile equipment; ground wires and ground check wires) are incorporated by reference.

**§ 77.906 Trailing cables supplying power to low-voltage mobile equipment; ground wires and ground check wires.** On and after September 30, 1971, all trailing cables supplying power to portable or mobile equipment from low-voltage three-phase resistance grounded power systems shall contain one or more ground conductors having a cross-sectional area of not less than one-half the power conductor. Such trailing cables shall include an insulated conductor for the ground continuity check circuit except where a no less effective device has been approved by the Secretary to assure continuity. Splices made in low-voltage trailing cables shall provide continuity of all components.

### **GROUND CONTROL**

**§ 208.291. Highwalls, pits and spoil banks; plans.**

The provisions of 30 CFR 77.1000 (relating to highwalls, pits and spoil banks; plans) are incorporated by reference.

**§ 77.1000 Highwalls, pits and spoil banks; plans.**

Each operator shall establish and follow a ground control plan for the safe control of all highwalls, pits, and spoil banks to be developed after June 30, 1971, which shall be consistent with prudent engineering design and will insure safe working conditions. The mining methods employed by the operator shall be selected to insure highwall and spoil bank stability.

**§ 208.292. Filing of plan.**

The provisions of 30 CFR 77.1000-1 (relating to filing of plan) are incorporated by reference.

**§ 77.1000-1 Filing of plan.**

The operator shall file a copy of such plan, and revisions thereof, with the MSHA Coal Mine Safety and Health district office for the district in which the mine is located, and shall identify the name and location of the mine; the Mine Safety and Health Administration identification number if known; and the name and address of the mine operator.

**§ 208.293. Stripping; loose material.**

The provisions of 30 CFR 77.1001 (relating to stripping; loose material) are incorporated by reference.

**§ 77.1001 Stripping; loose material.**

Loose hazardous material shall be stripped for a safe distance from the top of pit or highwalls, and the loose unconsolidated material shall be sloped to the angle of repose, or barriers, baffle boards, screens, or other devices be provided that afford equivalent protection.

**§ 208.294. Box cuts; spoil material placement.**

The provisions of 30 CFR 77.1002 (relating to box cuts; spoil material placement) are incorporated by reference.

**§ 77.1002 Box cuts; spoil material placement.**

When box cuts are made, necessary precautions shall be taken to minimize the possibility of spoil material rolling into the pit.

**§ 208.295. Benches.**

The provisions of 30 CFR 77.1003 (relating to benches) are incorporated by reference.

**§ 77.1003 Benches.**

To insure safe operation, the width and height of benches shall be governed by the type of equipment to be used and the operation to be performed.

**§ 208.296. Ground control; inspections and maintenance; general.**

The provisions of 30 CFR 77.1004 (relating to ground control; inspection and maintenance; general) are incorporated by reference.

**§ 77.1004 Ground control; inspection and maintenance; general.**

(a) Highwalls, banks, benches, and terrain sloping into the working areas shall be examined after every rain, freeze, or thaw before men work in such areas, and such examination shall be made and recorded in accordance with § 77.1713.

(b) Overhanging highwalls and banks shall be taken down and other unsafe ground conditions shall be corrected promptly, or the area shall be posted.

**§ 208.297. Scaling highwalls; general.**

The provisions of 30 CFR 77.1005 (relating to scaling highwalls; general) are incorporated by reference.

**§ 77.1005 Scaling highwalls; general.**

(a) Hazardous areas shall be scaled before any other work is performed in the hazardous area. When scaling of highwalls is necessary to correct conditions that are hazardous to persons in the area, a safe means shall be provided for performing such work.

(b) Whenever it becomes necessary for safety to remove hazardous material from highwalls by hand, the hazardous material shall be approached from a safe direction and the material removed from a safe location.

**§ 208.298. Highwalls; men working.**

The provisions of 30 CFR 77.1006 (relating to highwalls; men working) are incorporated by reference.

**§ 77.1006 Highwalls; men working.**

(a) Men, other than those necessary to correct unsafe conditions, shall not work near or under dangerous highwalls or banks.

(b) Except as provided in paragraph (c) of this section, men shall not work between equipment and the highwall or spoil bank where the equipment may hinder escape from falls or slides.

(c) Special safety precautions shall be taken when men are required to perform repair work between immobilized equipment and the highwall or spoil bank and such equipment may hinder escape from falls or slides.

**§ 208.299. Drilling; general.**

The provisions of 30 CFR 77.1007 (relating to drilling; general) are incorporated by reference.

**§ 77.1007 Drilling; general.**

(a) Equipment that is to be used during a shift shall be inspected each shift by a competent person. Equipment defects affecting safety shall be reported.

(b) Equipment defects affecting safety shall be corrected before the equipment is used.

**§ 208.300. Relocation of drills; safeguards.**

The provisions of 30 CFR 77.1008 (relating to relocation of drills; safeguards) are incorporated by reference.

**§ 77.1008 Relocation of drills; safeguards.**

(a) When a drill is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast placed in a safe position.

(b) When a drill helper is used his location shall be made known to the operator at all times when the drill is being moved.

**§ 208.301. Drill; operation.**

The provisions of 30 CFR 77.1009 (relating to drill; operation) are incorporated by reference.

**§ 77.1009 Drill; operation.**

(a) While in operation drills shall be attended at all times.

(b) Men shall not drill from positions that hinder their access to the control levers, or from insecure footing or staging, or from atop equipment not designed for this purpose.

(c) Men shall not be on a mast while the drill bit is in operation unless a safe platform is provided and safety belts are used.

(d) Drill crews and others shall stay clear of augers or drill stems that are in motion. Persons shall not pass under or step over a moving stem or auger.

(e) In the event of power failure, drill controls shall be placed in the neutral position until power is restored.

(f) When churn drills or vertical rotary drills are used, drillers shall not be permitted to work under suspended tools, and when collaring holes, inspecting, or during any operation in which tools are removed from the hole, all tools shall be lowered to the ground or platform.



**§ 208.302. Collaring holes.**

The provisions of 30 CFR 77.1010 (relating to collaring holes) are incorporated by reference.

**§ 77.1010 Collaring holes.**

(a) Starter steels shall be used when collaring holes with hand-held drills.

(b) Men shall not hold the drill steel while collaring holes, or rest their hands on the chuck or centralizer while drilling.

**§ 208.303. Drill holes; guarding.**

The provisions of 30 CFR 77.1011 (relating to drill holes; guarding) are incorporated by reference.

**§ 77.1011 Drill holes; guarding.**

Drill holes large enough to constitute a hazard shall be covered or guarded.

**§ 208.304. Jackhammers; operation; safeguards.**

The provisions of 30 CFR 77.1012 (relating to jackhammers; operation; safeguards) are incorporated by reference.

**§ 77.1012 Jackhammers; operation; safeguards.**

Men operating or working near jackhammers or jackleg drills, or other drilling machines shall position themselves so that they will not be struck or lose their balance if the drill steel breaks or sticks.

**§ 208.305. Air drills; safeguards.**

The provisions of 30 CFR 77.1013 (relating to air drills; safeguards) are incorporated by reference.

**§ 77.1013 Air drills; safeguards.**

Air shall be turned off and bled from the air hoses before hand-held air drills are moved from one working area to another.

**FIRE PROTECTION**

**§ 208.311. Fire protection; training and organization.**

The provisions of 30 CFR 77.1100 (relating to fire protection; training and organization) are incorporated by reference.

**§ 77.1100 Fire protection; training and organization.**

Firefighting facilities and equipment shall be provided commensurate with the potential fire hazards at each structure, enclosure, and other facility (including custom coal preparation) at the mine and the employees at such facilities shall be instructed and trained annually in the use of such firefighting facilities and equipment.

**§ 208.312. Escape and evacuation; plan.**

The provisions of 30 CFR 77.1101 (relating to escape and evacuation; plan) are incorporated by reference.

**§ 77.1101 Escape and evacuation; plan.**

(a) Before September 30, 1971, each operator of a mine shall establish and keep current a specific escape and evacuation plan to be followed in the event of a fire.

(b) All employees shall be instructed on current escape and evacuation plans, fire alarm signals, and applicable procedures to be followed in case of fire.

(c) Plans for escape and evacuation shall include the designation and proper maintenance of adequate means for exit from all areas where persons are required to work or travel including buildings and equipment and in areas where persons normally congregate during the work shift.

**§ 208.313. Warning signs; smoking and open flame.**

The provisions of 30 CFR 77.1102 (relating to warning signs; smoking and open flame) are incorporated by reference.

**§ 77.1102 Warning signs; smoking and open flame.**

Signs warning against smoking and open flames shall be posted so they can be readily seen in areas or places where fire or explosion hazards exist.

**§ 208.314. Flammable liquids; storage.**

The provisions of 30 CFR 77.1103 (relating to flammable liquids; storage) are incorporated by reference.

**§ 77.1103 Flammable liquids; storage.**

(a) Flammable liquids shall be stored in accordance with standards of the National Fire Protection Association. Small quantities of flammable liquids drawn from storage shall be kept in properly identified safety cans.

(b) Unburied flammable-liquid storage tanks shall be mounted securely on firm foundations. Outlet piping shall be provided with flexible connections or other special fittings to prevent adverse effects from tank settling.

(c) Fuel lines shall be equipped with valves to cut off fuel at the source and shall be located and maintained to minimize fire hazards.

(d) Areas surrounding flammable-liquid storage tanks and electric substations and transformers shall be kept free from grass (dry), weeds, underbrush, and other combustible materials such as trash, rubbish, leaves, and paper for at least 25 feet in all directions.

**§ 208.315. Accumulations of combustible materials.**

The provisions of 30 CFR 77.1104 (relating to accumulations of combustible materials) are incorporated by reference.

**§ 77.1104 Accumulations of combustible materials.**

Combustible materials, grease, lubricants, paints, or flammable liquids shall not be allowed to accumulate where they can create a fire hazard.

**§ 208.316. Internal combustion engines; fueling.**

The provisions of 30 CFR 77.1105 (relating to internal combustion engines; fueling) are incorporated by reference.

**§ 77.1105 Internal combustion engines; fueling.**

Internal combustion engines, except diesels, shall be shut off and stopped before being fueled.

**§ 208.317. Battery-charging stations; ventilation.**

The provisions of 30 CFR 77.1106 (relating to battery-charging stations; ventilation) are incorporated by reference.

**§ 77.1106 Battery-charging stations; ventilation.**

Battery-charging stations shall be located in well-ventilated areas. Battery-charging stations shall be equipped with reverse current protection where such stations are connected directly to direct current power systems.

**§ 208.318. Belt conveyors.**

The provisions of 30 CFR 77.1107 (relating to belt conveyors) are incorporated by reference.

**§ 77.1107 Belt conveyors.**

Belt conveyors in locations where fire would create a hazard to personnel shall be provided with switches to stop the drive pulley automatically in the event of excessive slippage.

**§ 208.319. Firefighting equipment; requirements; general.**

The provisions of 30 CFR 77.1108 (relating to firefighting equipment; requirements; general) are incorporated by reference.

**§ 77.1108 Firefighting equipment; requirements; general.**

On and after September 30, 1971, each operator of a coal mine shall provide an adequate supply of firefighting equipment which is adapted to the size and suitable for use under the conditions present on the surface at the mine.

**§ 208.320. Type and capacity of firefighting equipment.**

The provisions of 30 CFR 77.1108-1 (relating to type and capacity of firefighting equipment) are incorporated by reference.

**§ 77.1108-1 Type and capacity of firefighting equipment.**

Firefighting equipment required under this § 77.1108 shall meet the following minimum requirements:

(a) **Waterlines.** Waterlines shall be capable of delivering 50 gallons of water a minute at a nozzle pressure of 50 pounds per square inch. Where storage tanks are used as a source of

water supply, the tanks shall be of 1,000-gallon capacity for each 1,000 tons of coal processed (average) per shift.

(b) **Fire extinguishers.** Fire extinguishers shall be:

- (1) Of the appropriate type for the particular fire hazard involved;
- (2) Adequate in number and size for the particular fire hazard involved;
- (3) Replaced immediately with fully charged extinguishers after any discharge is made from an extinguisher; and
- (4) Approved by the Underwriter's Laboratories, Inc., or the Factory Mutual Research Corp., or other competent testing agency acceptable to the Mine Safety and Health Administration.

(c) **Fire hose.** Fire hose and couplings shall meet the requirements of the Underwriter's Laboratories, Inc., or Factory Mutual Research Corp.'s specifications. Cotton or cotton-polyester jacketed hose shall be treated in accordance with the U.S. Department of Agriculture Forest Service Specification 182 for mildew resistance. The water pressure at the hose nozzle shall not be excessively high so as to present a hazard to the nozzle operator.

### **§ 208.321. Quantity and location of firefighting equipment.**

The provisions of 30 CFR 77.1109 (relating to quantity and location of firefighting equipment) are incorporated by reference.

### **§ 77.1109 Quantity and location of firefighting equipment.**

Preparation plants, dryer plants, tipples, drawoff tunnels, shops, and other surface installations shall be equipped with the following firefighting equipment.

(a) Each structure presenting a fire hazard shall be provided with portable fire extinguishers commensurate with the potential fire hazard at the structure in accordance with the recommendations of the National Fire Protection Association.

(b) Preparation plants shall be equipped with waterlines, with outlet valves on each floor, and with sufficient fire hose to project a water stream to any point in the plant. However, where freezing conditions exist or water is not available, a 125-pound multipurpose dry powder extinguisher may be substituted for the purposes of this paragraph (b) for each 2,500 square feet of floor space in a wooden or other flammable structure, or for each 5,000 square feet of floor space in a metal, concrete-block, or other type of non-flammable construction.

(c)

- (1) Mobile equipment, including trucks, front-end loaders, bulldozers, portable welding units, and augers, shall be equipped with at least one portable fire extinguisher.

(2) Power shovels, draglines, and other large equipment shall be equipped with at least one portable fire extinguisher; however, additional fire extinguishers may be required by an authorized representative of the Secretary.

(3) Auxiliary equipment such as portable drills, sweepers, and scrapers, when operated more than 600 feet from equipment required to have portable fire extinguishers, shall be equipped with at least one fire extinguisher.

(d) Fire extinguishers shall be provided at permanent electrical installations commensurate with the potential fire hazard at such installation in accordance with the recommendations of the National Fire Protection Association.

(e) Two portable fire extinguishers, or the equivalent, shall be provided at each of the following combustible liquid storage installations:

(1) Near each above ground or unburied combustible liquid storage station; and,

(2) Near the transfer pump of each buried combustible liquid storage tank.

(f) Vehicles transporting explosives and blasting agents shall be equipped with fire protection as recommended in Code 495, section 20, National Fire Protection Association Handbook, 12<sup>th</sup> Edition, 1962.

#### **§ 208.322. Examination and maintenance of firefighting equipment.**

The provisions of 30 CFR 77.1110 (relating to examination and maintenance of firefighting equipment) are incorporated by reference.

#### **§ 77.1110 Examination and maintenance of firefighting equipment.**

Firefighting equipment shall be continuously maintained in a usable and operative condition. Fire extinguishers shall be examined at least once every six months and the date of such examination shall be recorded on a permanent tag attached to the extinguisher.

#### **§ 208.323. Welding, cutting and soldering; use of fire extinguisher.**

The provisions of 30 CFR 77.1111 (relating to welding, cutting, soldering; use of fire extinguisher) are incorporated by reference.

#### **§ 77.1111 Welding, cutting, soldering; use of fire extinguisher.**

One portable fire extinguisher shall be provided at each location where welding, cutting, or soldering with arc or flame is performed.

**§ 208.324. Welding, cutting or soldering with arc or flame; safeguards.**

The provisions of 30 CFR 77.1112 (relating to welding, cutting, soldering with arc or flame; safeguards) are incorporated by reference.

**§ 77.1112 Welding, cutting, or soldering with arc or flame; safeguards.**

(a) When welding, cutting, or soldering with arc or flame near combustible materials, suitable precautions shall be taken to insure that smoldering metal or sparks do not result in a fire.

(b) Before welding, cutting, or soldering is performed in areas likely to contain methane, an examination for methane shall be made by a qualified person with a device approved by the Secretary for detecting methane. Examinations for methane shall be made immediately before and periodically during welding, cutting, or soldering and such work shall not be permitted to commence or continue in air which contains 1.0 volume per centum or more of methane.

**MAPS**

**§ 208.331. Mine map.**

The provisions of 30 CFR 77.1200 (relating to mine map) are incorporated by reference.

**§ 77.1200 Mine map.**

The operator shall maintain an accurate and up-to-date map of the mine, on a scale of not less than 100 nor more than 500 feet to the inch, at or near the mine, in an area chosen by the mine operator, with a duplicate copy on file at a separate and distinct location, to minimize the danger of destruction by fire or other hazard. The map shall show:

(a) Name and address of the mine;

(b) The property or boundary lines of the active areas of the mine;

(c) Contour lines passing through whole number elevations of the coalbed being mined. The spacing of such lines shall not exceed 25-foot elevation levels, except that a broader spacing of contour lines may be approved by the District Manager for steeply pitching coalbeds. Contour lines may be placed on overlays or tracings attached to mine maps.

(d) The general elevation of the coalbed or coalbeds being mined, and the general elevation of the surface;

(e) Either producing or abandoned oil and gas wells located on the mine property;

(f) The location and elevation of any body of water dammed or held back in any portion of the mine: Provided, however, Such bodies of water may be shown on overlays or tracings attached to the mine maps;

(g) All prospect drill holes that penetrate the coalbed or coalbeds being mined on the mine property;

(h) All auger and strip mined areas of the coalbed or coalbeds being mined on the mine property together with the line of maximum depth of holes drilled during auger mining operations.

(i) All worked out and abandoned areas;

(j) The location of railroad tracks and public highways leading to the mine, and mine buildings of a permanent nature with identifying names shown;

(k) Underground mine workings underlying and within 1,000 feet of the active areas of the mine;

(l) The location and description of at least two permanent base line points, and the location and description of at least two permanent elevation bench marks used in connection with establishing or referencing mine elevation surveys; and,

(m) The scale of the map.

**§ 208.332. Certification of mine maps.**

The provisions of 30 CFR 77.1201 (relating to certification of mine maps) are incorporated by reference.

**§ 77.1201 Certification of mine maps.**

Mine maps shall be made or certified by an engineer or surveyor registered by the State in which the mine is located.

**§ 208.333. Availability of mine map.**

The provisions of 30 CFR 77.1202 (relating to availability of mine map) are incorporated by reference.

**§ 77.1202 Availability of mine map.**

The mine map maintained in accordance with the provisions of § 77.1200 shall be available for inspection by the Secretary or his authorized representative.

**PERSONNEL HOISTING**

**§ 208.341. Personnel hoists and elevators.**

The provisions of 30 CFR 77.1400 (relating to personnel hoists and elevators) are incorporated by reference.

**§ 77.1400 Personnel hoists and elevators.**

Except as provided in § 77.1430, the sections in this Subpart O apply only to hoists and elevators, together with their appurtenances, that are used for hoisting persons.

**§ 208.342. Automatic controls and brakes.**

The provisions of 30 CFR 77.1401 (relating to automatic controls and brakes) are incorporated by reference.

**§ 77.1401 Automatic controls and brakes.**

Hoists and elevators shall be equipped with overspeed, overwind, and automatic stop controls and with brakes capable of stopping the elevator when fully loaded.

**§ 208.343. Rated capacity.**

The provisions of 30 CFR 77.1402 (relating to rated capacity) are incorporated by reference.

**§ 77.1402 Rated capacity.**

Hoists and elevators shall have rated capacities consistent with the loads handled.

**§ 208.344. Maximum load; posting.**

The provisions of 30 CFR 77.1402-1 (relating to maximum load; posting) are incorporated by reference.

**§ 77.1402-1 Maximum load; posting.**

The operator shall designate the maximum number of men permitted to ride on each hoist or elevator at one time; this limit shall be posted on each elevator and on each landing.

**§ 208.345. Daily examination of hoisting equipment.**

The provisions of 30 CFR 77.1403 (relating to daily examination of hoisting equipment) are incorporated by reference.

**§ 77.1403 Daily examination of hoisting equipment.**

Hoists and elevators shall be examined daily and such examinations shall include, but not be limited to, the following:

**(a) Elevators.**

- (1) A visual examination of the ropes for wear, broken wires, and corrosion, especially at excessive strain points such as near the attachments and where the rope rests on the sheaves;
- (2) An examination of the elevator for loose, missing or defective parts;

**(b) Hoists and elevators.**

- (1) An examination of the rope fastenings for defects;
- (2) An examination of sheaves for broken flanges, defective bearings, rope alignment, and proper lubrication; and
- (3) An examination of the automatic controls and brakes required under § 77.1401.

**§ 208.346. Certifications and records of daily examinations.**

The provisions of 30 CFR 77.1404 (relating to certifications and records of daily examinations) are incorporated by reference.

**§ 77.1404 Certifications and records of daily examinations.**

At the completion of each daily examination required by § 77.1403, the person making the examination shall certify, by signature and date, that the examination has been made. If any unsafe condition is found during the examinations required by § 77.1403, the person conducting the examination shall make a record of the condition and the date. Certifications and records shall be retained for one year.



**§ 208.347. Operation of hoisting equipment after repairs.**

The provisions of 30 CFR 77.1405 (relating to operation of hoisting equipment after repairs) are incorporated by reference.

**§ 77.1405 Operation of hoisting equipment after repairs.**

Empty conveyances shall be operated at least one round trip before hoisting persons after any repairs.

**WIRE ROPES**

**§ 208.351. Wire ropes; scope.**

The provisions of 30 CFR 77.1430 (relating to wire ropes; scope) are incorporated by reference.

**§ 77.1430 Wire ropes; scope.**

(a) Sections 77.1431 through 77.1438 apply to wire ropes in service used to hoist—

- (1) Persons in shafts and slopes underground;
- (2) Persons with an incline hoist on the surface; or
- (3) Loads in shaft or slope development when persons work below suspended loads.

(b) These standards do not apply to wire ropes used for elevators.

**§ 208.352. Minimum rope strength.**

The provisions of 30 CFR 77.1431 (relating to minimum rope strength) are incorporated by reference.

**§ 77.1431 Minimum rope strength.**

At installation, the nominal strength (manufacturer's published catalog strength) of wire ropes used for hoisting shall meet the minimum rope strength values obtained by the following formulas in which "L" equals the maximum suspended rope length in feet:

(a) **Winding drum ropes** (all constructions, including rotation resistant).

For rope lengths less than 3,000 feet:

$$\text{Minimum Value} = \text{Static Load} \times (7.0 - 0.001L)$$

For rope lengths 3,000 feet or greater:

$$\text{Minimum Value} = \text{Static Load} \times 4.0$$

(b) **Friction drum ropes.**

For rope lengths less than 4,000 feet:

$$\text{Minimum Value} = \text{Static Load} \times (7.0 - 0.0005L)$$

For rope lengths 4,000 feet or greater:

$$\text{Minimum Value} = \text{Static Load} \times 5.0$$

(c) **Tail ropes** (balance ropes).

$$\text{Minimum Value} = \text{Weight of Rope} \times 7.0$$

**§ 208.353. Initial measurement.**

The provisions of 30 CFR 77.1432 (relating to initial measurement) are incorporated by reference.

**§ 77.1432 Initial measurement.**

After initial rope stretch but before visible wear occurs, the rope diameter of newly installed wire ropes shall be measured at least once in every third interval of active length and the measurements averaged to establish a baseline for subsequent measurements. A record of the measurements and the date shall be made by the person taking the measurements. This record shall be retained until the rope is retired from service.

**§ 208.354. Examinations.**

The provisions of 30 CFR 77.1433 (relating to examinations) are incorporated by reference.

**§ 77.1433 Examinations.**

(a) At least once every 14 calendar days, each wire rope in service shall be visually examined along its entire active length for visible structural damage, corrosion, and improper lubrication or dressing. In addition, visual examination for wear and broken wires shall be made at stress points, including the area near attachments, where the rope rests on sheaves, where the rope leaves the drum, at drum crossovers, and at change-of-layer regions. When any visible condition that results in a reduction of rope strength is present, the affected portion of the rope shall be examined on a daily basis.

(b) Before any person is hoisted with a newly installed wire rope or any wire rope that has not been examined in the previous 14 calendar days, the wire rope shall be examined in accordance with paragraph (a) of this section.

(c) At least once every six months, nondestructive tests shall be conducted of the active length of the rope, or rope diameter measurements shall be made—

- (1) Wherever wear is evident;
- (2) Where the hoist rope rests on sheaves at regular stopping points;
- (3) Where the hoist rope leaves the drum at regular stopping points; and
- (4) At drum crossover and change-of-layer regions.

(d) At the completion of each examination required by paragraph (a) of this section, the person making the examination shall certify, by signature and date, that the examination has been made. If any condition listed in paragraph (a) of this standard is present, the person conducting the examination shall make a record of the condition and the date. Certifications and records of examinations shall be retained for one year.

(e) The person making the measurements or nondestructive tests as required by paragraph (c) of this section shall record the measurements or test results and the date. This record shall be retained until the rope is retired from service.

**§ 208.355. Retirement criteria.**

The provisions of 30 CFR 77.1434 (relating to retirement criteria) are incorporated by reference.

**§ 77.1434 Retirement criteria.**

Unless damage or deterioration is removed by cutoff, wire ropes shall be removed from service when any of the following conditions occurs:

- (a) The number of broken wires within a rope lay length, excluding filler wires, exceeds either—
  - (1) Five percent of the total number of wires; or
  - (2) 15 percent of the total number of wires within any strand;
- (b) On a regular lay rope, more than one broken wire in the valley between strands in one rope lay length;
- (c) A loss of more than one-third of the original diameter of the outer wires;
- (d) Rope deterioration from corrosion;
- (e) Distortion of the rope structure;
- (f) Heat damage from any source;
- (g) Diameter reduction due to wear that exceeds six percent of the baseline diameter measurement; or
- (h) Loss of more than ten percent of rope strength as determined by nondestructive testing.

**§ 208.356. Load end attachments.**

The provisions of 30 CFR 77.1435 (relating to load end attachments) are incorporated by reference.

**§ 77.1435 Load end attachments.**

- (a) Wire rope shall be attached to the load by a method that develops at least 80 percent of the nominal strength of the rope.
- (b) Except for terminations where use of other materials is a design feature, zinc (spelter) shall be used for socketing wire ropes. Design feature means either the manufacturer's original design or a design approved by a registered professional engineer.
- (c) Load end attachment methods using splices are prohibited.

**§ 208.357. Drum end attachment.**

The provisions of 30 CFR 77.1436 (relating to drum end attachment) are incorporated by reference.

**§ 77.1436 Drum end attachment.**

- (a) For drum end attachment, wire rope shall be attached—
  - (1) Securely by clips after making one full turn around the drum spoke;
  - (2) Securely by clips after making one full turn around the shaft, if the drum is fixed to the shaft; or
  - (3) By properly assembled anchor bolts, clamps, or wedges, provided that the attachment is a design feature of the hoist drum. Design feature means either the manufacturer's

original design or a design approved by a registered professional engineer.

(b) A minimum of three full turns of wire rope shall be on the drum when the rope is extended to its maximum working length.

**§ 208.358. End attachment retermination.**

The provisions of 30 CFR 77.1437 (relating to end attachment retermination) are incorporated by reference.

**§ 77.1437 End attachment retermination.**

Damaged or deteriorated wire rope shall be removed by cutoff and the rope reterminated where there is—

- (a) More than one broken wire at an attachment;
- (b) Improper installation of an attachment;
- (c) Slippage at an attachment; or
- (d) Evidence of deterioration from corrosion at an attachment.

**§ 208.359. End attachment replacement.**

The provisions of 30 CFR 77.1438 (relating to end attachment replacement) are incorporated by reference.

**§ 77.1438 End attachment replacement.**

Wire rope attachments shall be replaced when cracked, deformed, or excessively worn.

## **LOADING AND HAULAGE**

**§ 208.361. Loading and haulage; general.**

The provisions of 30 CFR 77.1600 (relating to loading and haulage; general) are incorporated by reference.

**§ 77.1600 Loading and haulage; general.**

- (a) Only authorized persons shall be permitted on haulage roads and at loading or dumping locations.
- (b) Traffic rules, signals, and warning signs shall be standardized at each mine and posted.
- (c) Where side or overhead clearances on any haulage road or at any loading or dumping location at the mine are hazardous to mine workers, such areas shall be conspicuously marked and warning devices shall be installed when necessary to insure the safety of the workers.

**§ 208.362. Transportation of persons; restrictions.**

The provisions of 30 CFR 77.1601 (relating to transportation of persons; restrictions) are incorporated by reference.

**§ 77.1601 Transportation of persons; restrictions.**

No person shall be permitted to ride or be otherwise transported on or in the following equipment whether loaded or empty:

- (a) Dippers, shovels, buckets, forks, and clamshells;
- (b) The cargo space of dump trucks or haulage equipment used to transport coal or other material;

- (c) Outside the cabs and beds of mobile equipment;
- (d) Chain, belt, or bucket conveyors, except where such conveyors are specifically designed to transport persons; and
- (e) Loaded buckets on aerial tramways.

**§ 208.363. Trains and locomotives; authorized persons.**

The provisions of 30 CFR 77.1603 (relating to trains and locomotives; authorized persons) are incorporated by reference.

**§ 77.1603 Trains and locomotives; authorized persons.**

- (a) Only authorized persons shall be permitted to ride on trains or locomotives and they shall ride in a safe position.
- (b) Men shall not get on or off moving equipment, except that trainmen may get on or off of slowly moving trains.

**§ 208.364. Transportation of persons; overcrowding.**

The provisions of 30 CFR 77.1604 (relating to transportation of persons; overcrowding) are incorporated by reference.

**§ 77.1604 Transportation of persons; overcrowding.**

- (a) No man-trip vehicle or other conveyance used to transport persons to and from work areas at surface coal mines shall be overcrowded and all persons shall ride in a safe position.
- (b) Supplies, materials, and tools other than small handtools shall not be transported with men in man-trip vehicles unless such vehicles are specifically designed to make such transportation safe.

**§ 208.365. Loading and haulage equipment; installations.**

The provisions of 30 CFR 77.1605 (relating to loading and haulage equipment; installations) are incorporated by reference.

**§ 77.1605 Loading and haulage equipment; installations.**

- (a) Cab windows shall be of safety glass or equivalent, in good condition and shall be kept clean.
- (b) Mobile equipment shall be equipped with adequate brakes, and all trucks and front-end loaders shall also be equipped with parking brakes.
- (c) Positive-action type brakes shall be provided on aerial tramways.
- (d) Mobile equipment shall be provided with audible warning devices. Lights shall be provided on both ends when required.
- (e) Guard nets or other suitable protection shall be provided where tramways pass over roadways, walkways, or buildings.
- (f) Guards shall be installed to prevent swaying buckets from hitting towers.
- (g) Aerial tramway cable connections shall be designed to offer minimum obstruction to the passage of wheels.
- (h) Rocker-bottom or bottom-dump cars shall be equipped with positive locking devices, or other suitable devices.

- (i) Ramps and dumps shall be of solid construction, of ample width, have ample clearance and headroom, and be kept reasonably free of spillage.
- (j) Chute-loading installations shall be designed so that the men pulling chutes are not required to be in a hazardous position during loading operations.
- (k) Berms or guards shall be provided on the outer bank of elevated roadways.
- (l) Berms, bumper blocks, safety hooks, or similar means shall be provided to prevent overtravel and overturning at dumping locations.
- (m) Roadbeds, rails, joints, switches, frogs, and other elements on railroads shall be designed, installed, and maintained in a safe manner consistent with the speed and type of haulage.
- (n) Where practicable, a minimum of 30 inches continuous clearance from the farthest projection of moving railroad equipment shall be provided on at least one side of the tracks; all places where it is not possible to provide 30-inch clearance shall be marked conspicuously.
- (o) Track guardrails, lead rails, and frogs shall be protected or blocked so as to prevent a person's foot from becoming wedged.
- (p) Positive-acting stop-blocks, derail devices, track skates, or other adequate means shall be installed wherever necessary to protect persons from runaway or moving railroad equipment.
- (q) Switch throws shall be installed so as to provide adequate clearance for switchmen.
- (r) Where necessary, bumper blocks or the equivalent shall be provided at all track dead ends.

**§ 208.366. Loading and haulage equipment; inspection and maintenance.**

The provisions of 30 CFR 77.1606 (relating to loading and haulage equipment; inspection and maintenance) are incorporated by reference.

**§ 77.1606 Loading and haulage equipment; inspection and maintenance.**

- (a) Mobile loading and haulage equipment shall be inspected by a competent person before such equipment is placed in operation. Equipment defects affecting safety shall be recorded and reported to the mine operator.
- (b) Carriers on aerial tramways, including loading and unloading mechanisms, shall be inspected each shift; brakes shall be inspected daily; ropes and supports shall be inspected as recommended by the manufacturer or as physical conditions warrant. Equipment defects affecting safety shall be reported to the mine operator.
- (c) Equipment defects affecting safety shall be corrected before the equipment is used.

**§ 208.367. Loading and haulage equipment; operation.**

The provisions of 30 CFR 77.1607 (relating to loading and haulage equipment; operation) are incorporated by reference.

**§ 77.1607 Loading and haulage equipment; operation.**

- (a) Vehicles shall follow at a safe distance; passing shall be limited to areas of adequate clearance and visibility.
- (b) Mobile equipment operators shall have full control of the equipment while it is in motion.
- (c) Equipment operating speeds shall be prudent and consistent with conditions of roadway, grades, clearance, visibility, traffic, and the type of equipment used.
- (d) Cabs of mobile equipment shall be kept free of extraneous materials.
- (e) Operators shall sit facing the direction of travel while operating equipment with dual controls.
- (f) When an equipment operator is present, men shall notify him before getting on or off equipment.
- (g) Equipment operators shall be certain, by signal or other means, that all persons are clear before starting or moving equipment.
- (h) Where possible, aerial tramways shall not be started until the tramway operator has ascertained that everyone is in the clear.
- (i) Dust control measures shall be taken where dust significantly reduces visibility of equipment operators.
- (j) Dippers, buckets, loading booms, or heavy suspended loads shall not be swung over the cabs of haulage vehicles until the drivers are out of the cabs and in safe locations, unless the trucks are designed specifically to protect the drivers from falling material.
- (k) Men shall not work or pass under the buckets or booms of loaders in operation.
- (l) Tires shall be deflated before repairs on them are started and adequate means shall be provided to prevent wheel locking rims from creating a hazard during tire inflation.
- (m) Electrically powered mobile equipment shall not be left unattended unless the master switch is in the off position, all operating controls are in the neutral position, and the brakes are set or other equivalent precautions are taken against rolling.
- (n) Mobile equipment shall not be left unattended unless the brakes are set. The wheels shall be turned into a bank or berm, or shall be blocked, when such equipment is parked on a grade.
- (o) Lights, flares, or other warning devices shall be posted when parked equipment creates a hazard to vehicular traffic.
- (p) Dippers, buckets, scraper blades, and similar movable parts shall be secured or lowered to the ground when not in use.
- (q) Shovel trailing cables shall not be moved with the shovel dipper unless cable slings or sleds are used.

- (r) Equipment which is to be hauled shall be loaded and protected so as to prevent sliding or spillage.
- (s) When moving between work areas, the equipment shall be secured in the travel position.
- (t) Any load extending more than four feet beyond the rear of the vehicle body should be marked clearly with a red flag by day and a red light at night.
- (u) Tow bars shall be used to tow heavy equipment and a safety chain shall be used in conjunction with each tow bar.
- (v) Railroad cars shall be kept under control at all times by the car dropper. Cars shall be dropped at a safe rate and in a manner that will insure that the car dropper maintains a safe position while working and traveling around the cars.
- (w) Railroad cars shall not be coupled or uncoupled manually from the inside of curves unless the railroad and cars are so designed to eliminate any hazard from coupling or uncoupling cars from inside of curves.
- (x) Persons shall wear safety belts when dropping railroad cars.
- (y) Railcars shall not be left on sidetracks unless ample clearance is provided for traffic on adjacent tracks.
- (z) Parked railcars, unless held effectively by brakes, shall be blocked securely.
- (aa) Railroad cars and all trucks shall be trimmed properly when they have been loaded higher than the confines of their cargo space.
- (bb) When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make certain that all persons are in the clear before starting the conveyor. When the entire length of the conveyor is not visible from the starting switch, a positive audible or visible warning system shall be installed and operated to warn persons that the conveyor will be started.
- (cc) Unguarded conveyors with walkways shall be equipped with emergency stop devices or cords along their full length.
- (dd) Adequate backstops or brakes shall be installed on inclined-conveyor drive units to prevent conveyors from running in reverse if a hazard to personnel would be caused.
- (ee) Aerial tram conveyor buckets shall not be overloaded, and feed shall be regulated to prevent spillage.

**§ 208.368. Dumping facilities.**

The provisions of 30 CFR 77.1608 (relating to dumping facilities) are incorporated by reference.

**§ 77.1608 Dumping facilities.**

- (a) Dumping locations and haulage roads shall be kept reasonably free of water, debris, and spillage.
- (b) Where the ground at a dumping place may fail to support the weight of a loaded dump truck, trucks shall be dumped a safe distance back from the edge of the bank.



- (c) Adequate protection shall be provided at dumping locations where persons may be endangered by falling material.
- (d) Grizzlies, grates, and other sizing devices at dump and transfer points shall be anchored securely in place.
- (e) If truck spotters are used, they shall be well in the clear while trucks are backing into dumping position and dumping; lights shall be used at night to direct trucks.

## **MISCELLANEOUS**

### **§ 208.371. Communications in work areas.**

The provisions of 30 CFR 77.1700 (relating to communications in work areas) are incorporated by reference.

#### **§ 77.1700 Communications in work areas.**

No employee shall be assigned, or allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger his safety unless he can communicate with others, can be heard, or can be seen.

### **§ 208.372. First aid equipment; location; minimum requirements.**

The provisions of 30 CFR 77.1707 (relating to first aid equipment; location; minimum requirements) are incorporated by reference.

#### **§ 77.1707 First aid equipment; location; minimum requirements.**

- (a) Each operator of a surface coal mine shall maintain a supply of the first aid equipment set forth in paragraph (b) of this section at or near each working place where coal is being mined, at each preparation plant and at shops and other surface installation where ten or more persons are regularly employed.
- (b) The first aid equipment required to be maintained under the provisions of paragraph (a) of this section shall include at least the following:
  - (1) One stretcher;
  - (2) One broken-back board (if a splint-stretcher combination is used it will satisfy the requirements of both paragraph (b) (1) of this section and this paragraph (b) (2));
  - (3) Twenty-four triangular bandages (15 if a splint-stretcher combination is used);
  - (4) Eight 4-inch bandage compresses;
  - (5) Eight 2-inch bandage compresses;
  - (6) Twelve 1-inch adhesive compresses;
  - (7) An approved burn remedy;
  - (8) Two cloth blankets;
  - (9) One rubber blanket or equivalent substitute;
  - (10) Two tourniquets;
  - (11) One 1-ounce bottle of aromatic spirits of ammonia or one dozen ammonia ampules; and,

- (12) The necessary complements of arm and leg splints or two each inflatable plastic arm and leg splints.
- (c) All first aid supplies required to be maintained under the provisions of paragraphs (a) and (b) of this section shall be stored in suitable, sanitary, dust tight, moisture proof containers and such supplies shall be accessible to the miners.

**§ 208.373. Protective clothing; requirements.**

The provisions of 30 CFR 77.1710 (relating to protective clothing; requirements) are incorporated by reference.

**§ 77.1710 Protective clothing; requirements.**

Each employee working in a surface coal mine or in the surface work areas of an underground coal mine shall be required to wear protective clothing and devices as indicated below:

- (a) Protective clothing or equipment and face-shields or goggles shall be worn when welding, cutting, or working with molten metal or when other hazards to the eyes exist.
- (b) Suitable protective clothing to cover the entire body when handling corrosive or toxic substances or other materials which might cause injury to the skin.
- (c) Protective gloves when handling materials or performing work which might cause injury to the hands; however, gloves shall not be worn where they would create a greater hazard by becoming entangled in the moving parts of equipment.
- (d) A suitable hard hat or hard cap when in or around a mine or plant where falling objects may create a hazard. If a hard hat or hard cap is painted, nonmetallic based paint shall be used.
- (e) Suitable protective footwear.
- (f) Snug-fitting clothing when working around moving machinery or equipment.
- (g) Safety belts and lines where there is danger of falling; a second person shall tend the lifeline when bins, tanks, or other dangerous areas are entered.
- (h) Lifejackets or belts where there is danger from falling into water.
- (i) Seatbelts in a vehicle where there is a danger of overturning and where roll protection is provided.

**§ 208.374. Distinctively colored hard hats or hard caps; identification for newly employed, inexperienced miners.**

The provisions of 30 CFR 77.1710-1 (relating to distinctively colored hard hats or hard caps; identification for newly employed, inexperienced miners) are incorporated by reference.

**§ 77.1710-1 Distinctively colored hard hats or hard caps; identification for newly employed, inexperienced miners.**

Hard hats or hard caps distinctively different in color from those worn by experienced miners shall be worn at all times

by each newly employed, inexperienced miner when working in or around a mine or plant for at least one year from the date of his initial employment as a miner or until he has been qualified or certified as a miner by the State in which he is employed.

**§ 208.375. Smoking prohibition: surface work areas.**

(a) The provisions of 30 CFR 77.1711 (relating to smoking prohibition) are incorporated by reference.

(b) An individual who violates the mandatory safety standards relating to smoking, including the use of electronic liquid-vaporizing devices or e-cigarettes, shall be subject to a civil penalty assessed by the Department, which penalty:

(1) shall be the maximum civil penalty provided under 30 CFR 100.5(d) (relating to determination of penalty amount; special assessment) adopted and incorporated by reference for each occurrence of this violation.

(2) May not preclude the Department from exercising any other remedy available to it.

**§ 77.1711 Smoking prohibition.**

No person shall smoke or use an open flame where such practice may cause a fire or explosion.

**§ 208.376. Smoking prohibition: underground areas.**

(a) An individual may not smoke or use an open flame in any underground bituminous coal mine.

(b) An individual may not at any time enter a mine with or carry into the mine any smoking or smoker-related articles, matches, pipes, cigars, cigarettes, electronic liquid-vaporizing devices, including e-cigarettes, or any device for making flames or fire not approved under section 350 of the act (52 P.S. § 690-350).

(c) In all mines the operator may search or cause to be searched any individual, including the individual's clothing and material belongings, entering or about to enter the mine, or inside the mine, to prevent an individual from taking or carrying into the mine any of the articles prohibited by this section.

(d) An individual who violates the mandatory safety standards relating to smoking or the use or carrying of the items identified in subsection (b), shall be subject to a civil penalty assessed by the Department that:

(1) Shall be the maximum civil penalty provided under 30 CFR 100.5(d) (relating to determination of penalty amount; special assessment) adopted and incorporated by reference for each occurrence of this violation.

(2) May not preclude the Department from exercising any other remedy available to it.

## **TROLLEY WIRES AND TROLLEY FEEDER WIRES**

### **§ 208.381. Cutout switches.**

The provisions of 30 CFR 77.1800 (relating to cutout switches) are incorporated by reference.

### **§ 77.1800 Cutout switches.**

Trolley wires and trolley feeder wires shall be provided with cutout switches at intervals of not more than 2,000 feet and near the beginning of all branch lines.

### **§ 208.382. Overcurrent protection.**

The provisions of 30 CFR 77.1801 (relating to overcurrent protection) are incorporated by reference.

### **§ 77.1801 Overcurrent protection.**

Trolley wires and trolley feeder wires shall be provided with overcurrent protection.

### **§ 208.383. Devices for overcurrent protection.**

The provisions of 30 CFR 77.1801-1 (relating to devices for overcurrent protection) are incorporated by reference.

### **§ 77.1801-1 Devices for overcurrent protection.**

Automatic circuit interrupting devices that will deenergize the affected circuit upon occurrence of a short circuit at any point in the system will meet the requirements of § 77.1801.

### **§ 208.384. Insulation of trolley wires, trolley feeder wires and bare signal wires; guarding of trolley wires and trolley feeder wires.**

The provisions of 30 CFR 77.1802 (relating to insulation of trolley wires, trolley feeder wires and bare signal wires; guarding of trolley wires and trolley feeder wires) are incorporated by reference.

### **§ 77.1802 Insulation of trolley wires, trolley feeder wires and bare signal wires; guarding of trolley wires and trolley feeder wires.**

Trolley wires, trolley feeder wires, and bare signal wires shall be adequately guarded:

- (a) At all points where men are required to work or pass regularly under the wires; and
- (b) At man-trip stations.

The Secretary or his authorized representative shall specify other conditions where trolley wires and trolley feeder wires shall be adequately protected to prevent contact by any person, or shall require the use of improved methods to prevent such contact. Temporary guards shall be provided where trackmen and other persons are required to work in proximity to trolley wires and trolley feeder wires.

## **SLOPE AND SHAFT SINKING**

### **§ 208.391. Slopes and shafts; approval of plans.**

The provisions of 30 CFR 77.1900 (relating to slopes and shafts; approval of plans) are incorporated by reference, with the following addition: The Department will approve plans relating to slope and shaft sinking and construction.

### **§ 77.1900 Slopes and shafts; approval of plans.**

(a) Each operator of a coal mine shall prepare and submit for approval by the Coal Mine Health and Safety District Manager for the district in which the mine is located, a plan providing for the safety of workmen in each slope or shaft that is commenced or extended after June 30, 1971. The plan shall be consistent with prudent engineering design. The methods employed by the operator shall be selected to minimize the hazards to those employed in the initial or subsequent development of any such slope or shaft, and the plan shall include the following:

- (1) The name and location of the mine, and the Mine Safety and Health Administration mine identification number, if known;
- (2) The name and address of the mine operator;
- (3) A description of the construction work and methods to be used in the construction of the slope or shaft, and whether part or all of the work will be performed by a contractor and a description of that part of the work to be performed by a contractor;
- (4) The elevation, depth and dimensions of the slope or shaft;
- (5) The location and elevation of the coalbed;
- (6) The general characteristics of the strata through which the slope or shaft will be developed;
- (7) The type of equipment which the operator proposes to use when the work is to be performed by the operator. When work is to be performed by a contractor the operator shall, as soon as known to him, supplement the plan with a description of the type of equipment to be used by the contractor;
- (8) The system of ventilation to be used; and
- (9) Safeguards for the prevention of caving during excavation.

### **§ 208.392. Compliance with approved slope and shaft sinking plans.**

The provisions of 30 CFR 77.1900-1 (relating to compliance with approved slope and shaft sinking plans) are incorporated by reference.

**§ 77.1900-1 Compliance with approved slope and shaft sinking plans.**

Upon approval by the Coal Mine Health and Safety District Manager of a slope or shaft sinking plan, the operator shall adopt and comply with such plan.

**§ 208.393. Preshift and onshift inspections; reports.**

The provisions of 30 CFR 77.1901 (relating to preshift and onshift inspections; reports) are incorporated by reference.

**§ 77.1901 Preshift and onshift inspections; reports.**

(a) Examinations of slope and shaft areas shall be made by a certified person for hazardous conditions, including tests for methane and oxygen deficiency:

- (1) Within 90 minutes before each shift;
- (2) At least once on any shift during which men are employed inside any slope or shaft during development; and
- (3) Both before and after blasting.

(b) The surface area surrounding each slope and shaft shall be inspected by a certified person and all hazards in the vicinity shall be corrected before men are permitted to enter the excavation.

(c) All hazards found during any preshift or onshift inspection shall be corrected before men are allowed to enter, or continue to work in such slope or shaft. If hazardous conditions cannot be corrected, or excessive methane concentrations cannot be diluted, the excavation shall be vacated and no person shall be permitted to reenter the slope or shaft to continue excavation operations until the hazardous condition has been abated.

(d) No work shall be performed in any slope or shaft, no drilling equipment shall be started, and no electrical equipment shall be energized if the methane content in such slope or shaft is 1.0 volume per centum, or more.

(e) Nothing in this § 77.1901 shall prevent the specific assignment of men in the slope or shaft for purposes of abating excessive methane concentrations or any other hazardous condition.

(f) The results of all inspections conducted in accordance with the provisions of paragraph (a) of this section shall be recorded in a book approved by the Secretary.

**§ 208.394. Methane and oxygen deficiency tests; approved devices.**

The provisions of 30 CFR 77.1901-1 (relating to methane and oxygen deficiency tests; approved devices) are incorporated by reference.

**§ 77.1901-1 Methane and oxygen deficiency tests; approved devices.**

Tests for oxygen deficiency shall be made with a permissible flame safety lamp or other means approved by the Secretary,

and tests for methane shall be made with a methane detector approved by the Secretary.

**§ 208.395. Drilling and mucking operations.**

The provisions of 30 CFR 77.1902 (relating to drilling and mucking operations) are incorporated by reference.

**§ 77.1902 Drilling and mucking operations.**

Diesel-powered equipment used in the drilling, mucking, or other excavation of any slope or shaft shall be permissible, and such equipment shall be operated in a permissible manner and shall be maintained in a permissible condition.

**§ 208.396. Permissible diesel-powered equipment.**

The provisions of 30 CFR 77.1902-1 (relating to permissible diesel-powered equipment) are incorporated by reference.

**§ 77.1902-1 Permissible diesel-powered equipment.**

Diesel-powered equipment which has been approved by the Bureau of Mines or the Mine Safety and Health Administration under Part 36 of this chapter (Bureau of Mines Schedule 31) is permissible under the provisions of this section.

**§ 208.397. Hoists and hoisting; minimum requirements.**

The provisions of 30 CFR 77.1903 (relating to hoists and hoisting; minimum requirements) are incorporated by reference.

**§ 77.1903 Hoists and hoisting; minimum requirements.**

(a) Hoists used in transporting persons and material during drilling, mucking, or other excavating operations in any slope or shaft shall have rated capacities consistent with the loads to be handled.

(b) Each hoist used in drilling, mucking, or other excavating operations shall be equipped with an accurate and reliable indicator of the position of the cage, platform, or bucket. The indicator shall be installed in clear view of the hoist operator.

**§ 208.398. Communications between slope and shaft bottoms and hoist operators.**

The provisions of 30 CFR 77.1904 (relating to communications between slope and shaft bottoms and hoist operators) are incorporated by reference.

**§ 77.1904 Communications between slope and shaft bottoms and hoist operators.**

(a) Two independent means of signaling shall be provided between the hoistman and all points in a slope or shaft where men are required to work. At least one of these means shall be audible to the hoistman. Signal codes used in any communication system shall be posted conspicuously at each slope and shaft.

(b) Signaling systems used for communication between slopes and shafts and the hoistman shall be tested daily.

**§ 208.399. Hoist safeguards; general.**

The provisions of 30 CFR 77.1905 (relating to hoist safeguards; general) are incorporated by reference.

**§ 77.1905 Hoist safeguards; general.**

(a) Hoists used to transport persons shall be equipped with brakes capable of stopping and holding the cage, bucket, platform, or other device when fully loaded.

(b) When persons are transported by a hoist, a second person familiar with and qualified to stop the hoist shall be in attendance, except where the hoist is fully equipped with overspeed, overwind, and automatic stop devices.

**§ 208.400. Hoists; daily inspection.**

The provisions of 30 CFR 77.1906 (relating to hoists; daily inspection) are incorporated by reference.

**§ 77.1906 Hoists; daily inspection.**

(a) Hoists used to transport persons shall be inspected daily. The inspection shall include examination of the headgear (headframe, sheave wheels, etc.), connections, links and chains, and other facilities.

(b) Prior to each working shift, and before a hoist is returned to service after it has been out of normal service for any reason, the hoist shall be run by the hoist operator through one complete cycle of operation before any person is permitted to be transported.

(c) At the completion of each daily examination required by paragraph (a) of this section, the person making the examination shall certify, by signature and date, that the examination has been made. If any unsafe condition in the hoisting equipment is present, the person conducting the examination shall make a record of the condition and the date. Certifications and records shall be retained for one year.

**§ 208.401. Hoist construction; general.**

The provisions of 30 CFR 77.1907 (relating to hoist construction; general) are incorporated by reference.

**§ 77.1907 Hoist construction; general.**

If hooks are used to attach cages or buckets to the socket or thimble of a hoisting rope, the hooks shall be self-closing.

**§ 208.402. Hoist installations; use.**

The provisions of 30 CFR 77.1908 (relating to hoist installations; use) are incorporated by reference.

**§ 77.1908 Hoist installations; use.**

(a) Where men are transported by means of a hoist and the depth of the shaft exceeds 50 feet, the hoist rope shall be suspended from a substantial hoisting installation which shall



be high enough to provide working clearance between the bottom of the sheave and the top of the cage or bucket.

(b) Where men are transported by means of a hoist and the depth of the shaft exceeds 100 feet, temporary shaft guides and guide attachments, or other no less effective means, shall be installed to prevent the cage, platform, or bucket from swinging.

(c) All guides and guide attachments, or other no less effective means, installed in accordance with paragraph (b) of this section shall be maintained to a depth of not less than 75 feet from the bottom of the shaft.

(d) Where crossheads are used, the cage, platform, or bucket shall not be hung more than 10 feet below the crosshead.

(e) Where men are required to embark or disembark from a cage, platform, or bucket suspended over or within a shaft, a loading platform shall be installed to insure safe footing.

(f) During the development of each slope or shaft, either a ladder or independently powered auxiliary hoist shall be provided to permit men to escape quickly in the event of an emergency.

(g) No person shall be permitted to ride the rim of any bucket or on the top of a loaded bucket.

(h) The number of persons permitted to ride in cages, skips, or buckets shall be limited so as to prevent overcrowding.

(i) Persons shall not be permitted to ride on a cage, skip, or bucket with tools or materials, except when necessary to handle equipment while in transit. Materials shall be secured to prevent shifting while being hoisted.

(j) The speed of buckets transporting persons shall not exceed 500 feet per minute and not more than 200 feet per minute when within 100 feet of any stop.

(k) A notice of established speeds shall be posted in clear view of the hoistman.

(l) Conveyances being lowered in a shaft in which men are working shall be stopped at least 15 feet above such men and shall be lowered further only after the hoistman has received a signal that all men who may be endangered by the conveyance are in the clear.

(m) No skip or bucket shall be raised or lowered in a slope or shaft until it has been trimmed to prevent material from falling back down the slope or shaft.

(n) Measures shall be taken to prevent material from falling back into the shaft while buckets or other conveyances are being unloaded.

(o) Properly attached safety belts shall be worn by all persons required to work in or over any shaft where there is a drop of 10 or more feet, unless other acceptable means are provided to prevent such persons from falling into the shaft.

**§ 208.403. Hoist operation; qualified hoistman.**

The provisions of 30 CFR 77.1908-1 (relating to hoist operation; qualified hoistman) are incorporated by reference.

**§ 77.1908-1 Hoist operation; qualified hoistman.**

Hoists shall be under the control of and operated by a qualified hoistman when men are in a slope or shaft.

**§ 208.404. Explosives and blasting; use of permissible explosives and shot-firing units.**

The provisions of 30 CFR 77.1909 (relating to explosives and blasting; use of permissible explosives and shot-firing units) are incorporated by reference.

**77.1909 Explosives and blasting; use of permissible explosives and shot-firing units.**

Except as provided in § 77.1909-1, only permissible explosives and permissible shot-firing units shall be used in sinking shafts and slopes.

**§ 208.405. Use of nonpermissible explosives and nonpermissible shot-firing units; approval by Health and Safety District Manager.**

The provisions of 30 CFR 77.1909-1 (relating to use of nonpermissible explosives and nonpermissible shot-firing units; approval by Health and Safety District Manager) are incorporated by reference.

**§ 77.1909-1 Use of nonpermissible explosives and nonpermissible shot-firing units; approval by Health and Safety District Manager.**

Where the Coal Mine Health and Safety District Manager has determined that the use of nonpermissible explosives and nonpermissible shot-firing units will not pose a hazard to any person during the development of a slope or shaft, he may, after written application by the operator, approve the use of such explosives and shot-firing units and issue a permit for the use of such explosives and devices setting forth the safeguards to be employed by the operator to protect the health and safety of any person exposed to such blasting.

**§ 208.406. Explosives and blasting; general.**

The provisions of 30 CFR 77.1910 (relating to explosives and blasting; general) are incorporated by reference, with the exception of the following modification:

(b) All explosive materials, detonators, and any other related blasting material employed in the development of any slope or shaft shall be stored, transported, carried, charged, and fired in accordance with Chapters 210 and 211 (relating to blasters' licenses; and storage, handling, and use of explosives). Except as provided in paragraph (c) of this section, all shots shall be fired from the surface.

**§ 77.1910 Explosives and blasting; general.**

(a) Light and power circuits shall be disconnected or removed from the blasting area before charging and blasting

(c) Where tests for methane have been conducted and methane has not been found and only permissible blasting units are being employed, shots may be fired from an upper level of the slope or shaft.

(d) Except as provided in paragraph (c) of this section, all men shall be removed from the slope or shaft prior to blasting.

(e) Blasting areas in slopes or shafts shall be covered with mats or other suitable material when the excavation is too shallow to retain blasted material.

(f) Where it is impracticable to prepare primers in the blasting area, primers may be prepared on the surface and carried into the shaft in specially constructed, insulated, covered containers.

(g) No other development operation shall be conducted in a shaft or at the face of a slope while drill holes are being charged and until after all shots have been fired.

(h) The sides of the slope or shaft between the overhead platform and the bottom where men are working shall be examined after each blast and loose material removed.

(i) Loose rock and other material shall be removed from timbers and platforms after each blast before men are lowered to the shaft bottom.

**§ 208.407. Ventilation of slopes and shafts.**

The provisions of 30 CFR 77.1911 (relating to ventilation of slopes and shafts) are incorporated by reference.

**§ 77.1911 Ventilation of slopes and shafts.**

(a) All slopes and shafts shall be ventilated by mechanical ventilation equipment during development. Such equipment shall be examined before each shift and the quantity of air in the slope or shaft measured daily by a certified person and the results of such examinations and tests recorded in a book approved by the Secretary.

(b) Ventilation fans shall be:

(1) Installed on the surface;

(2) Installed in fireproof housing and connected to the slope or shaft opening with fireproof air ducts;

(3) Designed to permit the reversal of the air current, and located in an area which will prevent a recirculation of air from the slope or shaft or air contamination from any other source;

(4) Equipped with an automatic signal device designed to give an alarm in the event the fan slows or stops which can be seen or heard by any person on duty in the vicinity of the fan, except where fans are constantly attended.

(5) Offset not less than 15 feet from the shaft; and

(6) Equipped with air ducts which are fire resistant and maintained so as to prevent excessive leakage of air;

(i) Flexible ducts shall be constructed to permit ventilation by either exhausting or blowing methods and when metal air ducts are used, they shall be grounded effectively to remove static and other electrical charges;

(ii) Ducts shall extend as close to the bottom as necessary to ventilate properly.

(c) A qualified person, designated by the operator, shall be assigned to maintain each ventilating system.

(d) The fan shall be operated continuously when men are below the surface. Any accidental stoppage or reduction in airflow shall be corrected promptly; however, where repairs cannot be made immediately, development work below the surface shall be stopped and all the men not needed to make necessary repairs shall be removed to the surface.

#### **§ 208.408. Ladders and stairways.**

The provisions of 30 CFR 77.1912 (relating to ladders and stairways) are incorporated by reference.

#### **§ 77.1912 Ladders and stairways.**

(a) Substantial stairways or ladders shall be used during the construction of all shafts where no mechanical means are provided for men to travel.

(b) Landings at intervals of not more than 30 feet shall be installed.

(c) Shaft ladders shall project three feet above the collar of the shaft, and shall be placed at least three inches from the side of the shaft.

#### **§ 208.409. Fire-resistant wood.**

The provisions of 30 CFR 77.1913 (relating to fire-resistant wood) are incorporated by reference.

#### **§ 77.1913 Fire-resistant wood.**

Except for crossties, timbers, and other wood products which are permanently installed in slopes and shafts, shall be fire resistant.

#### **§ 208.410. Electrical equipment.**

The provisions of 30 CFR 77.1914 (relating to electrical equipment) are incorporated by reference.

#### **§ 77.1914 Electrical equipment.**

(a) Electric equipment employed below the collar of a slope or shaft during excavation shall be permissible and shall be maintained in a permissible condition.

(b) The insulation of all electric conductors employed below the collar of any slope or shaft during excavation shall be of the flame resistant type.

(c) Only lamps and portable flood lights approved by the Bureau of Mines or the Mine Safety and Health

Administration under Part 19 and Part 20 of this chapter (Bureau of Mines Schedules 6D and 10C) shall be employed below the collar of any slope or shaft.

**§ 208.411. Storage and handling of combustible materials.**

The provisions of 30 CFR 77.1915 (relating to storage and handling of combustible materials) are incorporated by reference.

**§ 77.1915 Storage and handling of combustible materials.**

(a) Compressed and liquefied gas, oil, gasoline, and other petroleum products shall not be stored within 100 feet of any slope or shaft opening.

(b) Other combustible material and supplies shall not be stored within 25 feet of any slope or shaft opening.

(c) Pyritic slates, bony coal, culm or other material capable of spontaneous combustion shall not be used for fill or as surfacing material within 100 feet of any slope or shaft opening.

(d) Areas surrounding the opening of each slope or shaft shall be constructed to insure the drainage of flammable liquids away from the slope or shaft in the event of spillage.

(e) Oily rags, waste, waste paper, and other combustible waste material disposed of in the vicinity of any slope or shaft opening shall be stored in closed containers until removed from the area.

**§ 208.412. Welding, cutting and soldering; fire protection.**

The provisions of 30 CFR 77.1916 (relating to welding, cutting, and soldering; fire protection) are incorporated by reference.

**§ 77.1916 Welding, cutting, and soldering; fire protection.**

(a) One portable fire extinguisher shall be provided where welding, cutting, or soldering with arc or flame is performed.

(b) Welding, cutting, or soldering with arc or flame within or in the vicinity of any slope or shaft, except where such operations are performed in fireproof enclosures, shall be done under the supervision of a qualified person who shall make a diligent search within or in the vicinity of the slope or shaft for fire during and after such operations.

(c) Before welding, cutting, or soldering is performed in any slope or shaft designed to penetrate into any coalbed below the surface, an examination for methane shall be made by a qualified person with a device approved by the Secretary for detecting methane. Examination for methane shall be made immediately before and periodically during welding, cutting, or soldering and such work shall not be permitted to commence or continue in air which contains 1.0 volume per centum or more of methane.

(d) Noncombustible barriers shall be installed below welding, cutting, or soldering operations in or over a shaft.

## CABLE SAFETY

### § 208.600. Sensitive ground fault.

All three-phase electrically operated equipment operated on a working section inby the last open crosscut must receive power from a circuit equipped with a sensitive ground fault protection as specified in this section.

(1) *Sensitive ground fault.*

(i) A sensitive ground fault protective device must be connected so that the associated circuit will be instantaneously interrupted upon the occurrence of a ground fault which may not exceed 300 milli-amperes nominally.

(ii) A sensitive ground fault protective device on these circuits on equipment utilizing variable speed drives must be connected so that the associated circuit will be instantaneously interrupted upon the occurrence of a ground fault which may not exceed 300 milli-amperes nominally. If nuisance tripping occurs on these circuits, the devices shall be permitted to be adjusted to the minimum setting necessary to prevent nuisance tripping. In no case shall a device be adjusted greater than the lower value of 500 milli-amperes or  $\frac{1}{2}$  of the neutral ground resistor's current rating.

(iii) The secondary main circuit breaker protecting any sensitive ground fault circuit subject to this section must also provide backup sensitive ground fault protection. Relay settings may include a short time delay (250mS) or a higher current setting, or both, to provide coordination. In no case shall a device be adjusted greater than the lower value of 500 milli-amperes or  $\frac{1}{2}$  of the neutral ground resistor's current rating.

(2) *Implementation schedule.* This section is effective January 13, 2018, for load centers that power equipment that operates inby the last open crosscut and that are purchased after January 13, 2018, and load centers that are rebuilt at new mines after January 13, 2018. For load centers that power equipment that operates inby the last open crosscut that are located in or at a mine on January 13, 2018, sensitive ground fault protection shall be installed by January 13, 2023.