

TITLE 62: MINING  
CHAPTER I: DEPARTMENT OF NATURAL RESOURCES

PART 220  
SURFACE INSTALLATION HEALTH AND SAFETY

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February 7, 1986; amended at 10 Ill. Reg. 8104, effective June 15, 1986; amended at 13 Ill. Reg. 5955, effective April 18, 1989; amended at 13 Ill. Reg. 13220, effective August 7, 1989; corrected at 13 Ill. Reg. 13907; amended at 15 Ill. Reg. 1006, effective January 14, 1991; amended at 16 Ill. Reg. 11463, effective July 6, 1992; recodified from the Department of Mines and Minerals to the Department of Natural Resources at 21 Ill. Reg. 16192.

#### Section 220.10 Introduction and Definitions

- a) Adoption of Regulations-Scope and Authority.  
This Part sets forth mandatory safety standards for bituminous, anthracite and lignite surface coal mines, including open pit and auger mines, preparation facilities and all other surface work areas of underground and surface coal mines. In adopting this part, the Mining Board implements The Coal Mining Act, (Ill. Rev. Stat. 1987, ch. 96 1/2, pars. 312 and 3802). None of these rules provide for any protection at a level which is below that established in the federal standards for surface installation health and safety.
- b) Definitions.  
For the purposes of this Part the term:
- "Active workings" means any place in a coal mine where miners are normally required to work or travel;
- "American Table of Distances" means the February 1986 edition of the "The American Table of Distances for Storage of Explosives" published by the Institute of Makers of Explosives Suite 310, 1120 Nineteenth Street N.W., Washington D.C. 20036-2605 (The reference does not include any later amendments or editions.);
- "Barricaded" means to obstruct passage of persons, vehicles, or flying materials;
- "Berm" means a pile or mound of material capable of restraining a vehicle;
- "Blasting agent" means any material or mixture, consisting of fuel and oxidizer, that is intended for blasting and not otherwise defined as an explosive; if the finished product, as mixed for use or shipment, cannot be detonated by means of a number 8 test blasting cap when unconfined. A number 8 test blasting cap is one containing 2 grams of a mixture of 80 percent mercury fulminate and 20 percent potassium chlorate, or a blasting cap of equivalent strength. An equivalent strength cap comprises 0.40-0.45 grams of PETN base charge pressed in an aluminum shell with bottom thickness not to exceed 0.03 of an inch, to a specific

gravity of not less than 1.4 g/cc., and primed with standard weights of primer depending on the manufacturer.

"Blasting Area" means the area near blasting operations in which concussion or flying material can reasonably be expected to cause injury;

"Blasting cap" means a detonator containing a charge of detonating compound, which is ignited by electric current, or the spark of a fuse.

"Blasting Circuit" means electric circuits used to fire electric detonators or to ignite an igniter cord by means of an electric starter;

"Blasting switch" means a switch used to connect a power source to a blasting circuit;

"Box-type magazine" means a small, portable magazine used to store limited quantities of explosives or detonators for short periods of time in locations at the mine which are convenient to the blasting sites at which they will be used;

"Capped fuse" means a length of safety fuse to which a detonator has been attached;

"Capped primer" means a package or cartridge of explosives which is specifically designed to transmit detonation to other explosives and which contains a detonator;

"Certified" as applied to any person, means a person certified as a Surface Mine Supervisor by the Mining Board to perform duties prescribed by these rules, and the laws of the State of Illinois;

"Circuit breaker" means a mechanical switching device capable of carrying electrical current under normal circuit conditions and also, carrying for a specified time, and breaking currents under overload, undercurrent and short circuit conditions;

"Connection box" means a boxlike enclosure with a removable lid/plate/door or other means of access within which electric connections between sections of cable can be made;

"Department" means the Department of Natural Resources of the State of Illinois;

"Detonating cord" or "detonating fuse" means a flexible cord containing a core of high explosive;

"Detonator" means a device containing a small detonating charge that is used for detonating an explosive, including, but not limited to blasting caps, exploders, electric detonators, and delay electric blasting caps;

"Director" means the Director of the Department of Natural Resources of the State of Illinois;

"Electrical grounding" means to connect with the ground to make the earth part of the circuit;

"Explosive" means any chemical compound, mixture, or device the primary or common purpose of which is to function by explosion. Explosives include, but are not limited to black powder, dynamite, nitroglycerin, fulminate, ammonium nitrate when mixed with a hydrocarbon, and other blasting agents;

"Flash point" means the minimum temperature at which sufficient vapor is released by a liquid or solid to form a flammable vapor-air mixture at atmospheric pressure;

"Fuse" means an electrical overload protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it;

"High-voltage" means more than one thousand (1,000) volts;

"Low-voltage" means up to and including six hundred sixty (660) volts ;

"Medium-voltage" means voltages from six hundred sixty-one (661) to one thousand (1,000) volts;

"Mining Board" means the State Mining Board in the Department of Natural Resources, Office of Mines and Minerals created by Section 5.04 of the Civil Administrative Code of Illinois (20 ILCS 5/5.04).

"Misfires" means the complete or partial failure of a blasting charge to explode as planned;

"Mobile electric equipment" means equipment capable of moving under its own power;

"Portable electric equipment" means equipment that is actually moved or can be readily moved from one place to another. Some illustrative examples include:

electric hand tools;

electric pumps and air compressors which receive power through a portable cable and are designed to be moved from place to place in a strip pit;

electric welders which receive power through a portable cable and are designed to be moved from place to place in a preparation plant or on board a unit of mobile electric equipment; and

a skid mounted substation which receives its power through a portable cable;

"Primer" or "Booster" means a package or cartridge of explosives which is designed specifically to transmit detonation to other explosives and which does not contain a detonator;

"Qualified person" means as the context requires;

"Rated" is a term that, applied to an operating characteristic, indicates the designated limit or limits of the characteristic for application under specified conditions;

"Resistance grounded systems" means electrical circuits that are grounded through impedance, the principal element of which is resistance;

"Roll protection" means a framework, safety canopy, or similar protection for the operator when equipment overturns;

"Safety can" means an approved container, of not over five (5) gallons capacity, having a spring-closing lid and spout cover;

"Safety fuse" means a train of powder enclosed in cotton, jute yarn, and waterproofing compounds which burns at a uniform rate; used for firing a cap containing the detonating compound which in turn sets off the explosive charge;

"Safety switch" means a sectionalizing switch that also provides shunt protection in blasting circuits between the blasting switch and the shot area.

"Stationary electric equipment" means equipment that is installed in a fixed location and is wired in a permanent manner. Some illustrative examples of stationary electric equipment include:

pendant type lighting fixtures even though the fixtures are suspended from the ceiling by a portable cord;  
electric welders which are installed in a fixed location and are wired with a permanent wiring method;  
electric pumps which are installed in a fixed location in a preparation plant and are wired with a permanent wiring method; and  
a skid mounted substation which is installed and grounded in a permanent manner and receives its power directly from an overhead power line.

(Source: Amended at 13 Ill. Reg. 5955, effective April 18, 1989)

#### Section 220.20 Surface Installations

- a) Surface Installations; General.
  - 1) All mine structures, enclosures, equipment, and other facilities (including coal preparation plants, facilities used in the work of preparing coal, construction areas, offices, shops, docks, garages, and laboratories) shall be maintained in good repair to prevent accidents and injuries to miners.
  - 2) The methane content in the air of any coal handling or storage facility shall be maintained at less than 1.0 volume per centum. At any time, the air in any structure, enclosure, or other facility shall contain not less than 19.5 volume per centum of oxygen, not more than 0.5 volume per centum of carbon dioxide, and no harmful quantities of other noxious or poisonous gases; and the volume of air shall be sufficient to dilute, render harmless, and to carry away flammable, explosive, noxious, and harmful gases and smoke.
- b) Tests for methane; qualified person; use of approved device.

Tests for oxygen deficiency or for methane in structures, enclosures, or other facilities in which coal is handled or stored shall be made by a person qualified to conduct such tests, and shall be made with a flame safety lamp or other device approved by the Department. Such tests shall be conducted at least once (1) 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.
- c) 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.
- d) Use of material or equipment overhead; safeguards; warning signs.

Where overhead repairs are being made at surface installations or on surface equipment, 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 materials is being used.

Warning signs shall be posted prominently in the area, which signs shall state "Danger-Men Working Above" or the equivalent.

- e) 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.
- f) Travelways at surface installations.
  - 1) Safe means of access shall be provided and maintained to all working places.
  - 2) 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.
  - 3) Inclined travelways shall be constructed of nonskid material or equipped with cleats.
  - 4) Regularly used travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.
  - 5) Crossovers, elevated walkways, elevated ramps, and stairways shall be of substantial construction, provided with handrails, and maintained in good condition. Where necessary to insure safety, toe boards shall be provided.
  - 6) Crossovers shall be provided where it is necessary to crossover conveyors.
  - 7) Moving conveyors shall be crossed only at designated crossing points.
  - 8) Crossing under unguarded moving conveyors where contact is possible is prohibited.
- g) Ladders; scaffolding; construction; condition, installation, and maintenance.
  - 1) General requirements; ladders & scaffolding.
    - A) Ladders and scaffolding equipment shall be of substantial construction and maintained in good safe, suitable, and proper condition.
    - B) Wooden members of ladder shall not be painted.
    - C) Rungs shall be kept free of grease and oil.
  - 2) Portable ladders; construction, use, and maintenance.
    - A) Portable ladders shall be so placed as to prevent slipping, or they shall be lashed or held in position. Ladders shall not be used in a horizontal position as platforms, runways, or scaffolds.
    - B) On two (2)-section extension ladders, the minimum overlap for the two (2) sections in use shall be as follows:

SIZE OF LADDER (FEET)	OVERLAP (FEET)
Up to and including 36	3
Over 36 and up to and including 48	4
Over 48 and up to and including 60	5

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- C) No ladder shall be used to gain access to a roof or platform unless the top of the ladder extends at least three (3) feet above the point of support, at eave, gutter, roof line, or platform.
  - D) Ladders shall be inspected before each use for broken rungs, split side rails, loose fastenings, decayed wood, or other defects. Ladders with defects shall not be used.
  - E) Portable aluminum ladders shall not be used when working on or near energized electrical equipment.
- 3) Fixed ladders.
- A) Steep, vertical, or any other ladder which inclines backwards at any point shall be anchored securely and provided with back guards or equivalent safety protection extending from a point not more than seven (7) feet from the bottom of the ladder to the top of the ladder.
  - B) Ladders shall extend at least three (3) feet above the landing or substantial handholds shall be provided above the landing.
  - C) Ladders shall be anchored securely and installed to provide at least three (3) inches of toe clearance.
  - D) Men climbing or descending ladders shall face the ladders and have both hands free for climbing.
- h) Scaffolding; general.
- 1) The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds.
  - 2) No scaffold shall be erected, moved, dismantled, or altered except under supervision of a person experienced in performing such work.
  - 3) Guardrails and toeboards shall be installed on all open sides and ends of platforms more than six (6) feet above the ground or floor.
  - 4) Scaffolds and their components shall be capable of supporting at least four (4) times the weight of the actual load.
  - 5) Any scaffold, including accessories such as braces, brackets, trusses, screw legs, and ladders, damaged or weakened from any cause shall be immediately repaired or replaced.
  - 6) All planking or platforms shall be overlapped (minimum twelve (12) inches) or secured from movement.
  - 7) Scaffold planks shall extend over their end supports not less than six (6) inches and not more than twelve (12) inches.
  - 8) The poles, legs, or uprights of scaffolds shall be securely and rigidly braced to prevent swaying and displacement.
  - 9) Overhead protection shall be provided for men on a scaffold exposed to overhead hazards.



- 10) Slippery conditions on scaffolds shall be eliminated prior to work being performed on such scaffolds.
  - 11) o welding, burning, riveting, or open flame work shall be performed on any staging suspended by means of fiber or synthetic rope. Only treated or protected fiber or synthetic rope shall be used for or near any work involving the use of corrosive substances or chemicals.
  - 12) Wire, synthetic, or fiber rope used for scaffold suspension shall be capable of supporting six (6) times the applied load.
  - 13) Scaffolds shall otherwise be erected, constructed and maintained in manner consistent with the laws and regulations of the State of Illinois, including, without limitation, "An Act providing for the protection and safety of persons in and about the construction, repairing alteration, or removal of buildings, bridges, viaducts, and other structures, and to provide for the enforcement thereof" (Ill. Rev. Stat. 1981, ch. 48, pars. 60 et seq.)
- i) 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.
  - j) Testing for leaking; compressed gas cylinders.  
Tests for leaks on the hose valves or gauges of liquefied and nonliquefied compressed gas cylinders shall only be made with a soft brush and soapy water or soap suds.
  - k) Storage of materials.
    - 1) Materials shall be stored and stacked in a manner which minimizes stumbling or fall-off-material hazards.
    - 2) Materials that can create hazards if accidentally liberated from their containers shall be stored in a manner that minimizes the dangers.
    - 3) Hazardous materials shall be stored in containers of a type approved for such use by recognized agencies; such containers shall be labeled appropriately.
    - 4) All compressed gas cylinders, including oxygen cylinders, and liquid gas cylinders, including acetylene cylinders, shall be secured in a safe manner, and shall be stored in an upright position.
    - 5) 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.
  - l) Surge bins and storage or surge 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 bin or storage or surge pile, where the reclaiming operation may expose him to a hazard.
  - m) Hoisting of materials; rigging equipment for material handling.

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- 1) Hoisting of materials.
    - A) Hitchings 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.
  - 2) Rigging equipment.
    - A) Slings, chains, and other equipment used for material handling shall be inspected immediately prior to each use. Defective rigging equipment shall be removed from service.
    - B) Rigging equipment shall not be loaded in excess of its safe working load.
  - n) Draw-off tunnels; stockpiling and reclaiming operation; general.
    - 1) 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.
    - 2) In addition to the tests for methane required by Section 220.20(b) of this Part, 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 Section 220.20 of this Part. Electric equipment shall not be energized, operated, or repaired until the air contains less than 1.0 volume per centum of methane.
  - o) 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 concentrations of methane reaches a maximum percentage as determined by an authorized representative of the Department, which maximum percentage shall not be more than 1.0 volume per centum of methane. An authorized representative of the Department shall require such monitor to deenergize automatically electric equipment when the concentration of methane reaches a maximum percentage as determined by such representative, which maximum percentage shall not be more than 2.0 volume per centum of methane.
  - p) Draw-off tunnel ventilation fans; installation.

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

    - 1) Installed on the surface;
    - 2) Installed in fireproof housings and connected to the tunnel openings with fireproof air ducts; and
    - 3) Offset from the tunnel opening.
  - q) Draw-off tunnel escapeways.

When it is necessary for a tunnel to be closed at one end, an escapeway not less than thirty (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 thirty (30) degrees from the horizontal it shall be equipped with a ladder which runs the full length of the inclined portion of the escapeway.

- r) Refuse piles; general.
- 1) All refuse piles shall be located in areas which are a safe distance from all underground mine airshafts, preparation plants, tipples, or other surface installations and such piles shall not be located over abandoned openings or steamlines.
  - 2) Where new refuse piles are constructed over exposed coal beds the exposed coal shall be covered with clay or other inert material as the piles are constructed.
  - 3) A fireproof barrier of clay or inert material shall be constructed between old and new refuse piles.
  - 4) Roadways to refuse piles shall be fenced or otherwise guarded to restrict the entrance of unauthorized persons.
  - 5) All refuse piles shall otherwise conform to the standards contained in relevant laws and regulations of the State of Illinois and the United States of America.
- s) Refuse piles; construction requirements.
- 1) Refuse deposited on a pile shall be spread in layers and compacted in such a manner so as to minimize the flow of air through the pile.
  - 2) Refuse shall not be deposited on a burning pile except for the purpose of controlling or extinguishing a fire.
  - 3) Clay or other sealants shall be used to seal the surface of any burning refuse pile.
  - 4) Surface seals shall be kept intact and protected from erosion by drainage facilities.
  - 5) Refuse piles shall not be constructed to as to impede drainage or impound water.
  - 6) Refuse piles shall be constructed in such a manner as to prevent accidental sliding and shifting of materials.
  - 7) No extraneous combustible material shall be deposited on refuse piles.
  - 8) All refuse piles shall otherwise conform to the construction standards contained in relevant laws and regulations of the State of Illinois and the United States of America.
- t) Retaining dams; construction; inspection; records.
- 1) If failure of a water or silt retaining dam will create a hazard, it shall be of substantial construction and shall be inspected at least once each week.

- 2) Weekly inspections conducted pursuant to paragraph (t)(1) above shall be conducted by a person qualified to conduct and report on such inspections, which person shall be designated by the operator. Such weekly reports shall be approved and signed by the certified person responsible for the overall supervision of the mine. The record of such inspections shall be kept at the mine for at least three (3) years in a suitably-bound book provided by the operator for such purposes, and such record shall be available at all times for review by any authorized representative of the Department.
- u) Amendments and additions to the Federal rules on refuse piles and impounding structures, adopted by Mining Enforcement and Safety Administration, and effective November 1, 1975. All those amendments and additions to the Federal rules regarding refuse piles and impounding structures, which amendments and additions were made effective November 1, 1975 by the Mining Enforcement and Safety Administration and the United States Department of Interior, and which rules are found 30 CFR 77; 215; 215-1; 215-2; 215-3; 215-4; 216; 216-1; 216-2; 216-3; 216-4; 216-5 and 217 are hereby incorporated by reference and made a permanent part of these rules.

#### Section 220.30 Thermal Dryers

- a) Thermal dryers; general.  
All dryer systems used for drying coal at high temperatures, hereinafter referred to as thermal dryers, including without limitation, rotary dryers, continuous carrier dryers, vertical tray, and cascade dryers, multilouver dryers, suspension or flash dryers, and fluidized bed dryers, shall be maintained and operated in accordance with the provisions of Section 220.30(b) through (f).
- b) Dryer heating units; operation.
  - 1) Dryer heating units shall be operated to provide reasonably complete combustion before heated gases are allowed to enter hot gas inlets.
  - 2) 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, 12th Edition, Section 9, "Installation of Pulverized Fuel Systems," 1962.
- c) 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.
- d) 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.

- e) 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:
  - 1) Hinged to prevent dislodgment;
  - 2) Designed and constructed to permit checking and testing by manual operation; and
  - 3) Equal in size to the cross-sectional area of the collector vortex finder where used to vent dry dust collectors.
- f) 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.
- g) 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 Department may require any of the following measures to be employed:
  - 1) 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.
  - 2) 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 shut down.
  - 3) 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.
- h) Thermal dryers; location and installation; general.
  - 1) All thermal dryer systems erected or installed at any coal mine shall be located at least one hundred (100) feet from any underground coal mine opening, and one hundred (100) feet from any surface installation where the heat, sparks, flames, or coal dust from the system might cause a fire or explosion.
  - 2) All thermal dryer systems erected or installed 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 (1) square foot of area for each eighty (80) cubic feet of space volume and which are distributed as uniformly as possible throughout the structure.

- i) Structures housing other facilities; use of partitions.  
All thermal dryer systems installed in any structure which also houses a tipple, 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.
- j) 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 qualified person, of the bypass dampers, air-tempering louvers, discharge mechanism, and other dryer system equipment.
- k) Control stations; location.  
All thermal dryer system control stations 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.
- l) Control panels.
  - 1) All thermal dryer system control panels 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.
  - 2) A schematic diagram containing legends which show the location of each thermocouple, pressure tap, or other control or gauging instrument in the drying system shall be posted on or near the control panel of each thermal drying system.
  - 3) Each instrument on the control panel shall be identified by a name-plate or equivalent marking.
  - 4) 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 procedure.
- m) 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.
- n) 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.
- o) 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.

- p) Automatic temperature control instruments.
  - 1) Automatic temperature control instruments for thermal dryer system shall be of the recording type.
  - 2) 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.
  - 3) All dryer control instruments shall be inspected and calibrated at least once (1) every three (3) months and a record or certificate of accuracy, signed by a person qualified to inspect and calibrate such instruments shall be kept at the plant.
- q) 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.

#### Section 220.40 Safeguard For Mechanical Equipment

- a) Mechanical equipment guards.
  - 1) Gears, sprockets, chains, drive, head, tail, and takeup pulleys, flywheels, couplings, shafts, sawblades, fan inlets, protruding set screws on revolving parts, and similar exposed moving machine parts which may be contacted by persons, and which may cause injury to persons shall be guarded. Guards shall be sufficiently strong and maintained to provide the required protection.
  - 2) Overhead belts shall be guarded if the whipping action from a broken line would be hazardous to persons below.
  - 3) 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.
  - 4) Except when testing the machinery, guards shall be securely in place while machinery is being operated.
- b) Stationary grinding machines; protective devices.
  - 1) Stationary grinding machines other than special bit grinders shall be equipped with:
    - A) Peripheral hoods (less than ninety degrees (90°) throat openings) capable of withstanding the force of a bursting wheel;
    - B) Adjustable tool rests set as close as practical to the wheel; and
    - C) Safety washers.
  - 2) Grinding wheels shall be operated within the specification of the manufacturer of the wheel.
  - 3) Face shields or goggles, in good condition shall be worn when operating a grinding wheel.

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- c) Tools-hand and power; general requirements.
    - 1) All hand and power tools shall be maintained in safe condition. Defective tools shall be removed from service.
    - 2) 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 as approved by an authorized representative of the Mining Board.
  - d) Power-operated hand tools.
    - 1) Electric power-operated tools.
      - A) Electric power-operated tools shall either be a double-insulated type approved by a nationally recognized testing laboratory or shall be grounded in accordance with Section 220.70 of this Part. Where such an approved double-insulated power-operated tool is employed, it shall be distinctly marked.
      - B) Electric cords shall not be used for hoisting or lowering tools.
    - 2) Pneumatic power tools.
      - A) Safety clips or retainers shall be securely installed on pneumatic impact tools to prevent attachments from being accidentally ejected.
      - B) All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed which operates at more than one hundred (100) P.S.I., at the tool, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners unless the muzzle is in contact with the work surface.
      - C) Hoses shall not be used for hoisting or lowering tools.
    - 3) Fuel-powered tools.

All fuel-powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled and stored in accordance with Section 220.110(d) of this Part, and all other applicable state and federal statutes, and rules.
    - 4) Power-actuated tools.
      - A) Only employees who have been instructed in the safe operation of the particular tool being used shall be permitted to operate a power-actuated tool.
      - B) The tool shall be tested each day before loading to see that the safety devices are in safe working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure.
      - C) Tools shall not be loaded until immediately prior to the intended firing time. Neither loaded nor empty tools are to be pointed at other personnel.



- D) Loaded tools shall not be left unattended.
  - E) Fasteners shall not be driven into materials harder than manufacturers' recommendations.
  - F) Driving into material easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the fastening device from passing completely through and creating a flying missile hazard on the other side.
  - G) Power-actuated tools shall not be used in hazardous locations as set forth in the National Electrical Code.
  - H) All tools shall be used with the appropriate shield, guard, or attachment recommended by the manufacturer.
  - I) Employees operating power-actuated tools shall keep all parts of their bodies behind the tool.
- e) Mobile equipment; falling object protective structures (FOPS).
- 1) When necessary to protect the operator of the equipment, all rubber-tired 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 Department may approve a FOPS which provides protection equivalent to SAE J 231.
  - 2) 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."
- f) Mobile equipment; rollover protective structures (ROPS).
- 1) 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 roll-over protective structures (hereinafter referred to as ROPS) in accordance with the requirements of paragraphs (f)(2) through (f)(6) of this Section, as applicable.
  - 2) All mobile equipment described in paragraph (f)(1) of this Section shall be equipped with ROPS meeting the requirements of the Department of Labor specified in 29 CFR 1926.1001, and 1926.2002-Safety and Health Regulations for Construction.

- 3) Except as provided in paragraph (f)(8) of this Section, mobile equipment described in paragraph (f)(1) of this Section, manufactured prior to September 1, 1974, shall be deemed in compliance with this Section if the ROPS is installed in accordance with the recommendations of the ROPS manufacturer or designer. The coal mine operator shall exhibit certification from the ROPS manufacturer or designer in the form of a label attached to the equipment indicating the manufacturer's or fabricator's name and address, the ROPS model number, if any, the machine make, model or series number that the structure is designed to fit, and compliance with the applicable specification listed in paragraph (c)(1) or (c)(2) of this Section, or he shall, upon request of the authorized representative of the Department, furnish certification from a registered professional engineer that:
- A) The ROPS complies with the Society of Automotive Engineers (SAE) Standard J 397, "Critical Zone-Characteristics and Dimensions for Operators of Construction and Industrial Machinery" or SAE J397a, "Deflection Limiting Volume for Laboratory Evaluation of Rollover Protective Structures (ROPS) and Falling Object Protective Structures (FOPS) of Construction and Industrial Vehicles" and the following applicable SAE Standards:
- i) J 320a, "Minimum Performance Criteria for Rollover Protective Structure for Rubber-Tired Self-Propelled Scrapers" or J320b, "Minimum Performance Criteria for Rollover Protective Structures for Primer Movers";
  - ii) J 394, "Minimum Performance Criteria for Rollover Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers" or J 394a, "Minimum Performance Criteria for Rollover Protective Structures for Wheeled Front-End Loaders and Wheeled Dozers";
  - iii) J 395, "Minimum Performance Criteria for Rollover Protective Structure for Crawler Tractors and Crawler-Type Loaders" or J 395a, "Minimum Performance Criteria for Rollover Protective Structures for Track-Type Tractors and Track-Type Front-End Loaders";
  - iv) J 396 or J 396a, "Minimum Performance Criteria for Rollover Protective Structures for Motor Graders";
  - v) J 167, "Protective Frame with Overhead Protection-Test Procedures and Performance Requirements"; or
  - vi) J 334a, "Protective Frame Test Procedures and Performance Requirements".
- B) The ROPS and supporting attachments will:

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- i) Show satisfactory performance by actual test of a prototype involving a roll of seven hundred twenty degrees (720°) or more;
  - ii) Support not less than the weight of the vehicle applied as a uniformly distributed and perpendicular to a vertical plane through the longitudinal axis of the prime mover, and support two (2) times the weight of the vehicle applied as a uniformly distributed vertical load to the top of the structure; or
  - iii) Support the following separately applied minimum loads: One hundred twenty-five (125) percent of the weight of the vehicle applied as a uniformly distributed horizontal load at the top of the ROPS and perpendicular to a critical plane through the longitudinal axis of the prime mover; and a load of twice the weight of the vehicle applied as a uniformly distributed vertical load to the top of the ROPS after complying with paragraph (f)(3)(A) of this Section. Stresses shall not exceed the ultimate strength. Steel used in the ROPS must have capability to perform at zero degrees (0°) F., or exhibit Charpy V-notch impact strength at eight (8) ft.-lb. at minus twenty degrees (-20°) F. with a standard Charpy V-notch Type A specimen and provide twenty (20) percent elongation over two (2) inches in a standard two (2) inch gauge length on a 0.505 inch diameter tensile specimen. Bolts and nuts shall be SAE grade eight (8) (reference SAE J 429d, J 429e, J 429f or J 429g, J 995, J 995a or J 995b).
- 4) Mobile equipment manufactured prior to September 1, 1974 meeting certain existing governmental requirements for ROPS. Mobile equipment described in paragraph (f)(1) of this Section, manufactured prior to September 1, 1974 and already equipped with ROPS, shall be deemed in compliance with this Section if it meets the ROPS requirements of the State of California, the U.S. Army Corps of Engineers, the Bureau of Reclamation of the U. S. Department of the Interior in effect on April 5, 1972, or the Occupational Safety and Health Administration, U.S. Department of Labor. The requirements in effect are:
- A) State of California: Construction Safety Orders 1591(i), 1596, and Logging and Sawmill Safety Order 5243, issued by the Department of Industrial Relations pursuant to Divison 5, Labor Code Section 6312, State of California;

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- B) U.S. Army Corps of Engineers: Safety-General Safety Requirements, EM-385-1-1 (March 1967);
  - C) Bureau of Reclamation, U.S. Department of the Interior: Safety and Health Regulations for Construction, Part II (September 1971); and
  - D) Occupational Safety and Health Administration, U.S. Department of Labor: Safety and Health Regulations for Construction, 29 CFR 1926.1001 and 1926.1002.
- 5) Field welding on ROPS shall be performed by welders who are certified by the coal mine operator or equipment distributor as being qualified in accordance with the American Welding Society Structural Welding Code AWS D1.1-73, or Military Standard MIL-STD 248, or the equivalent thereof.
  - 6) Seat belts required by Section 220.170(k)(9) shall be worn by the operator of mobile equipment required to be equipped with ROPS by this Section.
- g) Machinery and equipment; operation, maintenance, and examination.
- 1) Mobile and stationary equipment shall be properly maintained to assure safe operating conditions. The operator of such equipment shall report any dangerous equipment defect to the mine operator. When such condition is reported, the mine operator shall take immediate action to investigate the report, and when such equipment defect is found, the equipment shall be removed from service until the defect is corrected.
  - 2) All over-head hoists shall be secured by safety chains, ropes, or other safety devices so that in the event they become separated from the carriage track, they shall not fall.
  - 3) The ends of all stationary and all movable carriage rails shall be equipped with safety stops at each end.
    - A) This includes all carriage rails that are part of the system regardless if a hoist is or is not suspended from the rail at time of inspection.
    - B) A means shall be provided to secure the traveling bridge to assure that the movable rail will remain in place when both a movable rail and a stationary rail are being utilized to suspend the hoist. Hoisting equipment shall be closely examined to also make certain:
      - i) The the hoist is securely fastened to the dolly or other support;
      - ii) That the dolly rides the I-beam without excessive side play;
      - iii) That the hoist has proper operating controls that allow the hoist to be operated from a safe position. Under no condition, shall a person or persons position themselves under a suspended load. Taglines shall be used to position or to guide loads;
      - iv) That the dolly or hoist does not contain bent or defective parts or defective ropes or chains;

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- v) That the electric hoists are being examined frequently and maintained in a safe operating condition as required by Section 220.50(c) of this Part;
  - vi) That the hoist is being operated within its rated capacity;
  - vii) That the hoists attached to H-beams are being used for vertical lifting only;
  - viii) That all load hooks are equipped with safety latches;
  - ix) That limit switches are installed for both the hoisting and lowering of electrical hoists to insure that a minimum of three (3) turns of rope remain on the drum when the rope is extended to its maximum working length; and
  - x) That extensions or cheaters not be used on the handle of hand-operated hoists.
- h) Performing work from a raised position; safeguards.
- 1) 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.
  - 2) No work shall be performed under machinery or equipment that has been raised until such machinery or equipment has been securely blocked in position.
- i) Drive Belts.
- 1) Drive belts shall not be shifted while in motion unless the machines are provided with mechanical shifters.
  - 2) Belt dressings shall not be applied while belts are in motion except where it can be applied without endangering a person.
- j) Power-driven pulleys.
- 1) 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.
  - 2) Pulleys of conveyors shall not be cleaned manually while the conveyor is in motion.
  - 3) Coal or other material spilled beneath belt conveyor drives or tail pieces shall not be removed while the conveyor is in motion unless the drive or tail piece is adequately guarded, sufficient overhead clearance is provided, or special tools or equipment approved by an authorized representative of the Department are used to protect the miner performing the work.
- k) Welding operations.
- 1) Welding operations shall be shielded and the area shall be well ventilated.

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- 2) When air arcing and arc cutting is being performed, every precaution should be taken to minimize the effects of noise, dust, and smoke on men working in the area.
  - 3) Components of hoists shall not be used as welding grounds.
  - l) Shovels, draglines, and tractors.
    - 1) 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.
    - 2) Shovels and draglines shall be equipped with handrails along and around all walkways and platforms.
  - m) Mobile equipment; automatic warning devices.

Mobile equipment, such as trucks, forklifts, front-end loaders, tractors and graders, shall be equipped with an adequate automatic warning device which shall give an audible alarm when such equipment is put in reverse.
  - n) 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.
  - o) Compressed air systems.
    - 1) Compressors and compressed-air receivers shall be equipped with automatic pressure-relief valves, pressure gauges, and drain valves.
    - 2) 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.
    - 3) 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.
    - 4) Safety chains or suitable locking devices shall be used at connections to machines of high-pressure air hose lines of one (1) inch inside diameter or larger, and between high-pressure air hose line of one (1) inch inside diameter or larger, where a connection failure would create a hazard.
  - p) Boilers.
    - 1) Boilers shall be equipped with guarded, well-maintained water gauges and pressure gauges placed so that they can be observed easily. Water gauges and pipe passages to the gauges shall be kept clean and free of scale and rust.
    - 2) Boilers shall be equipped with automatic pressure-relief valves; valves shall be opened manually at least once (1) a week to determine that they will function properly.

- 3) Blow-off 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.
- 4) Boiler installations shall be provided with safety devices, meeting appropriate boiler code, to protect against hazards of flame outs, fuel interruptions, and low water level.
- 5) Boilers shall be inspected internally at least once (1) a year by a licensed boiler inspector and a certificate of inspection signed by the inspector shall be displayed in the vicinity of the boiler.

#### Section 220.50 Electrical Equipment-General

- a) Electric power circuits and electric equipment; deenergization. Power circuits and electric equipment shall be deenergized before work is done on such circuits or equipment, except when necessary for trouble-shooting or testing. 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 and 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.
- b) Electric circuits and equipment; repair.  
No electrical work shall be performed on electric circuits or equipment except by a person qualified to perform electrical work and to maintain electrical equipment, or by a person trained to perform electrical work and to maintain electrical equipment at the direction of a qualified person. When such work is done by a trained person, the circuits or equipment shall be examined by a qualified person to assure safe operating condition before such circuits or equipment are energized.
- c) Electric equipment; examination, testing, and maintenance.  
Electric equipment shall be frequently examined, tested and properly maintained by a person qualified to perform electrical work and to maintain electrical equipment to assure safe operating conditions. When a potentially dangerous condition is found on electric equipment, such equipment shall be identified and be removed from service until such condition is corrected. A record of such examinations shall be kept in an approved book, and shall include all dangerous conditions found, corrective actions taken, and the signature of the qualified person conducting the examination or testing. The record of examinations shall be signed by the person responsible for maintaining the equipment in safe operating condition, who shall also be a person qualified to perform electrical work and maintain electrical equipment, and records shall be made available for inspection by an authorized representative of the Department and the authorized representative of miners of such mine.
- d) Electric equipment; examination and testing.

A potentially dangerous condition within the meaning of Section 220.50(c) shall include without limitation, exposed conductors, improper frame grounding, missing guards, missing inspection covers, poorly-made splices in conductors, improper terminations, improper overload or short circuit protection, broken conduit, missing or malfunctioning safety devices, inoperative indicating lights, inoperative ground fault protection, defective monitoring circuits, and inadequate ground fields.

- e) Qualified person.  
A qualified person within the meaning of Sections 220.50(b), 220.50(c), 220.60(b), 220.80(b) and Section 220.90 of this Part is an individual who has been qualified as a coal miner electrician under 30 CFR 77.103, or anyone who may be so qualified in the future as a coal miner electrician by the Department, if and when such Department adopts rules affecting coal miner electrician certification.
- f) Electric equipment; frequency of examination and testing.  
The examinations and test required under the provisions of Section 220.50(c) shall be conducted as interpreted in the Mining Enforcement Safety Administration (MESA) Inspector's Manual at least monthly or more often if necessary to assure safe operating conditions. State Mine Inspectors shall be presented evidence of qualifications upon request.
- g) 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.
- h) Electric Conductors.  
Electric conductors, installed inside surface buildings and structures, shall be sufficient in size to meet the minimum current-carrying capacity provided for in the National Electrical Code in effect at the time of installation.
- i) Electric conductors; mobile and portable equipment.  
Trailing cable, portable cables, and electric conductors installed in mobile or portable equipment shall have ampacities and construction in accordance with the specifications of Insulated Power Cable Engineers Association-National Electrical Manufacturers Association in effect at time of purchase and the conductors shall be sufficient in size so that a rise in temperature resulting from normal operation will not damage the insulating material.
- j) Electrical connections or splices; suitability.  
Electrical connections or splices in electric conductors shall be mechanically and electrically efficient, and suitable connectors or approved splicing methods shall be used. All electrical connections or splices in insulated wire and cable shall be reinsulated at least to the same degree of protection as the remainder of the wire or cable.
- k) Cable fittings; suitability.



Cables shall enter metal frames of motors, splice boxes, and electric compartments only through proper fittings and shall be secured to prevent chaffing of the insulation. When insulated wires, other than wiring installed in conduit, pass through metal frames, the holes shall be substantially bushed with insulated bushings and the wires be secured.

- l) Electric equipment and circuits; overload, short-circuit, and ground fault 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. Ground fault protection shall be provided for equipment, powered by solidly or resistance grounds' systems.

- m) Electric equipment and circuits; overload and short-circuit protection; minimum requirements.

Devices providing short-circuits and overload protection shall conform to the minimum requirements for protection of electric circuits and equipment of the National Electrical Code in effect at the time of installation except that motors and circuits used in specially designed electrical systems, such as those used on some excavators, hoists and elevators, shall be considered as being provided with overload protection if the design of the system prevents the motors and associated circuits from being subjected to harmful overloads.

- n) Electric equipment-switches.

All electric equipment contracted for after the effective date of this regulation shall be provided with switches or other controls that are safely designed, constructed, and installed. The voltage of alternating current remote control circuits that are installed external to the controller enclosure shall not exceed one hundred twenty (120) volt.

- o) Lightning arresters; ungrounded, exposed power conductors, and telephone wires. All ungrounded, exposed power conductors, control lines, and communication wires shall be equipped with suitable lightning arresters which are adequately installed and connected to a low resistance grounding medium in accordance with Section 220.70(f).

- p) Lightning arresters; circuits entering or leaving buildings.

Lightning arresters protecting circuits entering or leaving buildings shall be provided at a point near where each such circuit enters or leaves the building.

- q) Transformers and high-voltage equipment; installation and guarding; minimum vertical clearance.

1) Transformers and other high-voltage equipment shall be of the enclosed type, or installed in a transformer house, or surrounded by a substantial fence at least six (6) feet high and at least three (3) feet from any energized parts, casings, or wiring.

2) Enclosures of high-voltage equipment shall be kept locked against unauthorized entry.

- 3) Electric equipment energized at more than one thousand (1,000) volts and containing unguarded live parts, shall be installed with a minimum vertical clearance above the surfaces where a person would normally stand, as follows:

Voltage Between Phases	Minimum Vertical Clearance of Unguarded Parts:	
	Feet	Inches
1,000 - 6,600	8	0
6,601 - 11,000	9	0
11,001 - 22,000	9	3
22,001 - 33,000	9	6
33,001 - 44,000	9	10
44,001 - 66,000	10	5
66,001 - 88,000	11	0
88,001 - 110,000	11	7
110,001 - 132,000	12	2

- r) 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.
- s) Danger signs at high-voltage electrical installations.  
Danger signs shall be posted at the entrance to all high-voltage electrical installations.
- t) Inspection and cover plates.  
Inspection and cover plates on electrical equipment shall be kept in place at all times except during testing or repairs. Equipment designed with exposed energized parts shall be properly guarded to prevent accidental contact.
- u) Insulated platforms at power switches.  
Insulated mats or platforms, insulated for the phase-to-phase voltage of the system, 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 noncurrent-carrying parts of the power switches to be operated, may be used.
- v) Switchboards; enclosures, passageways, and clearance.  
Switchboards in stationary installations which require back access shall be provided with 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. Enclosures containing

switchboards motor generators sets, transformers, oil circuit breakers, and resistance panels shall not be used for the storage of material.

- w) Bare signal or control wires; voltage.  
The voltage on bare signal or control wires accessible to personal contact shall not exceed forty (40) volts.
- x) Electric Wiring and equipment; Installation and maintenance.  
Except as otherwise provided in this Part, all wiring and electrical equipment installed after effective date of this regulation shall meet the requirements of the National Electric Code in effect at the time of installation.
- y) Hazardous locations, surface facilities; bituminous and lignite mines.
  - 1) All electrical circuits and equipment installed after effective date of this regulation with a coal preparation plant or other enclosure housing coal-handling facilities, except in sections where only wet coal is handled or in sections so maintained as to be free from dangerous amounts of coal dust, shall be of the type designed for hazardous locations, Class II, Group F, and installed in accordance with the requirements in Article 501 of the National Electrical Code.
  - 2) Enclosed areas where methane may accumulate and is not prevented from accumulating by an adequate ventilation system shall have electric circuits and equipment of the type designed for hazardous locations, Class I, Group D, and installed in accordance with the requirements in Article 501 of the National Electrical Code.
  - 3) An adequate ventilation system within the meaning of paragraph (b) above is a system in which:
    - A) The enclosed area is monitored continuously in accordance with the provisions of Section 220.20(n); and
    - B) The provisions of Section 220.20(a) are complied with.
- z) Approved permissible equipment.  
Permissible electrical equipment which is maintained in a permissible condition may be used in lieu of equipment required in Section 220.50(y).
- aa) Minimum wiring requirements for stationary structures and buildings; general.
  - 1) All wiring shall be installed so as to be adequately protected from physical damage;
  - 2) Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place;
  - 3) Cables, conductors, metal raceways, cable armor, boxes, fittings, supports, and other wiring hardware shall be of proper construction and material for the environment in which they are installed;
  - 4) Power cables within surface structures shall closely follow the surface of the building or the other continuous support and shall be secured at intervals not exceeding four and one-half (4 1/2) feet and within one (1) foot from every box fitting; and

- 5) All open conductors within surface structures shall closely follow the surface of the building and be installed on proper insulators which support the wires at least every four and one-half (4 1/2) feet.
- bb) Equipment marking.  
All electrical equipment purchased or rebuilt after the effective date of these rules shall be provided with a plate which indicates the manufacturer's name, rated voltage, current, horsepower, frequency, number of phases, and duty cycle.
- cc) Protection of power cables.  
All power cables and wiring shall be adequately protected against mechanical damage. If a cable is damaged to the extent that the outer jacket will not exclude moisture, or if the conductors or metallic shielding are exposed, the cable jacket shall be repaired to the same degree of protection as the remainder of the cable.
- dd) Identification.  
Circuit breakers, disconnects, control switches, and push buttons shall be marked to show which circuit they control, unless identification can be made readily by location.

#### Section 220.60 Trailing Cables

- a) Trailing cables; ampacity.  
All trailing cables shall meet the minimum requirements for construction and ampacity provided in the Standards of the Insulated Power Cable Engineers Association-National Electric Manufacturers Association in effect when such cables are purchased.
- b) Trailing cables; short-circuit, grounded phase protection, and disconnecting devices.  
Short-circuit protection for trailing cable shall be provided by a circuit breaker or other no less effective device of adequate current-interrupting capacity in each ungrounded conductor. One (1) breaker may protect multiple cables if the amperage setting on the breaker is set to the lowest amperage setting of the smallest circuit. Disconnecting devices shall be installed in conjunction with each circuit breaker and within three thousand (3,000) feet of each mobile machine. Such disconnecting devices used to connect 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.
- c) Short-circuit protection; ratings and settings of circuit breakers.  
Circuit breakers providing short-circuit protection for trailing cables shall be set at not more than eighty (80) percent of the short-circuit capability of the system. The maximum time for clearing a short circuit shall not exceed that cable time current rating specified by the Insulated Power Cable Engineers Association higher settings may be permitted by an authorized representative of the Department when he has determined that higher settings are justified.

- d) Design of trailing cable for low and medium voltage three (3) phase equipment. All trailing cables supplying power to equipment from low and medium-voltage systems purchased after effective date shall contain two (2) or more grounding conductors having a total cross-sectional area of not less than one-half (1/2) the power conductor and grounded metallic shields around each power conductor. The metallic shielding shall meet the requirements for shielding provided by the Standards of the Insulated Power Cable Engineers Association-National Electrical Manufacturers Association for type SH or SHD portable power cables. Such trailing cables shall include an insulated conductor for the ground continuity check circuit except in circuits in which a no less effective device for ground check monitoring approved by the Department is being utilized.
- e) Splicing of trailing cables.
- 1) When 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.
  - 2) Splices made in trailing cables shall provide continuity of all components including the grounded metallic shielding.
  - 3) Trailing cables or portable cables with exposed wires or splices that heat or spark under load shall not be used.
- f) Securing of Trailing Cables to equipment. Trailing cables shall be secured to machines in a manner to protect the cables from damage and to prevent strain on the electrical connections.
- g) Protection of trailing cables. Trailing cables shall be adequately protected to prevent damage by mobile equipment and placed to afford protection against rock slides and other falling objects. Surplus trailing cable to shovels, draglines, drills, and similar equipment shall be stored on reels mounted on the equipment or otherwise protected from mechanical damage. Damaged outer jackets of trailing cables shall be repaired to the same degree of protection as the remainder of the cable.
- h) Breaking trailing cable and power cable connections.
- 1) Plugs and connectors in trailing cables and power cables shall not be connected or disconnected while the circuit is energized.
  - 2) No power cable or electric circuit supplying power in excess of two hundred forty (240) volts will be energized or deenergized, hooked up or unhooked except by a person qualified under Section 220.50(e) of this Part to perform electrical work, or by a person trained to perform electrical work at the direction of a qualified person.
  - 3) This requirement shall not be construed to include the energizing or deenergizing of a simple "on-off" switch on standard equipment, when

such switch or equipment is located outside of any high-voltage switch house.

- i) Trailing Cables; Movement.  
Trailing cables shall not be moved with mobile equipment unless cable slings, sleds, or equivalent protection is provided.
- j) Energized trailing cables, handling.  
Energized trailing cables, where the phase-to-ground voltage is one hundred fifty (150) volts or more, shall be handled only by persons wearing protective gloves. Protective gloves must be worn while using insulated hooks or tongs.
- k) Protective gloves; minimum requirements.
  - 1) Protective gloves worn while handling high-voltage trailing cables shall be rated at least for the phase-to-ground voltage of the system and shall be used and tested in accordance with the provisions of Section 220.80(aa), (bb) and (cc).
  - 2) Protective gloves worn while handling low-voltage and medium-voltage trailing cables shall be rated for a minimum of the phase-to-ground voltage of the circuit.
  - 3) Protective gloves shall be inspected for defects before each use. Protective gloves which contain defects shall not be used.

(Source: Amended at 10 Ill. Reg. 224, effective February 7, 1986)

#### Section 220.70 Grounding

- a) Grounding, metallic shielding, armors, conduit enclosing power conductors, metallic frames, casings, and other metallic enclosures of electric equipment and circuits. Metallic shieldings, armors, conduits enclosing power conductors, metallic frames, casings, and other metallic enclosures of electric equipment and circuits 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 Department.
- b) Approved grounding methods; three (3)-phase systems.
  - 1) Resistance Grounded Systems. A grounding circuit consisting of a grounding wire that meets the requirements of Section 220.70(f), originating at the grounded side of the grounding resistor, shall extend along with the power conductors and serve as the grounding conductor for all metallic shielding, armors, conduit enclosing power conductors, metallic frames, casings, and other metallic enclosures of electric equipment and circuits that receive power from the circuit. The grounding resistor shall be located at the power source. The grounded side of the grounding resistor shall be connected to a low resistance ground field.
  - 2) Solidly Grounded Systems. The grounded point of three (3)-phase systems shall be grounded to a low resistance ground field and to the cases

of the source transformers. A grounding circuit that meets the requirements of Section 220.70(b)(1) shall originate at the grounded point of the circuit and extend along with the power conductors and serve as a grounding circuit for the frames, casings, and other metallic enclosures of all circuits and equipment receiving power from that circuit. The grounded point shall be located at the power source. In three (3)-phase, four (4)-wire systems in which the neutral is a power conductor, the neutral shall also be grounded to a low resistance ground field at the service entrance to building or at the utilization locations.

- 3) Ungrounded Systems. A grounding circuit, consisting of a grounding conductor that meets the requirements of Section 220.70(i) and originating at the grounded case or frame of the power source, shall extend along with the power conductors and serve as the grounding conductor for all metallic casings and other metallic enclosures of electrical equipment and circuits receiving power from that circuit. The grounded case or frame of the power source shall be connected to a low resistance ground field.
- c) Grounding method; single-phase system.  
Single phase systems shall be grounded in such manner so that the minimum amount of voltage will exist between the ungrounded conductors and earth. A conductor that meets the requirements of Section 220.70(i) shall originate at the grounded point in the circuit and extend along with the power conductors and serve as a grounding medium for the frames of all equipment receiving power from that circuit and such conductor shall also be grounded to a low resistance ground field at the service entrance or utilization points.
- d) Grounding methods; direct-current systems.
- 1) Direct-current systems having one (1) grounded polarity. In direct-current systems having one polarity grounded to a low resistance ground field the grounded feeder wire or track rail shall be approved grounding medium. A grounding circuit meeting the requirements of Section 220.70(f) shall originate at the grounded feeder wire or tract rail and extend along with the power conductors and serve as a grounding conductor for the frames, casing, and metallic enclosures of all circuits and equipment receiving power from that circuit.
  - 2) Direct current systems having a grounded neutral point. The grounded neutral point shall be the approved grounding medium. A grounding circuit meeting the requirements of Section 220.70(f) originate at the grounded neutral point and extend along with the power conductors and serve as a grounding conductor for the frames, casings, and metallic enclosures of all circuits and equipment receiving power from that circuit.
  - 3) Ungrounded direct-current circuits. In ungrounded direct-current circuits the grounded frame or casing of the power source shall be the approved grounding medium. In the event the power source is a direct-current

generator, the frame of the generator power source is a direct-current generator, the frame of the generator shall be connected to a low resistance ground field. A grounding circuit meeting the requirements of Section 220.70(f) shall originate at the grounded frame or casing of the power source and extend along with the power conductors and serve as a grounding conductor for the frames, casings, and metallic enclosures of all circuits and equipment receiving power from that circuit.

- e) Low resistance ground field; interpretation.
  - 1) A low resistance ground field as referred to in Section 220.90 of this Part is interpreted to mean: made electrodes, buried metallic piping system, metal building framework, well or borehole casing, steel piling, and other underground metal structures installed for purpose other than grounding which have a resistance to ground of not more than five (5) OHMS. Grounding fields shall be measured at the time of installation and at least annually thereafter to insure a sufficiently low resistance ground field has been established and is being maintained and such measurements shall be recorded and kept at the installation.
  - 2) An authorized representative of the Department may allow higher resistance to ground values if an investigation has revealed that such greater values of resistance will not pose a hazard to the miners.
- f) Grounding wires; capacity.

Where grounding wires are used to ground metallic shielding, armors, conduits, frames, casings, and other metallic enclosures, such grounding wires will be approved if:

  - 1) 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 (1/2) the cross-sectional area of the power conductor; or
  - 2) 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.
- g) Protection other than grounding.

Methods other than grounding which provide no less effective protection may be permitted by the Department or its authorized representative. Such methods shall not be used unless so approved.
- h) Grounding circuit; criteria.

The grounding circuit for equipment and conductor enclosures shall:

  - 1) Be permanent and continuous;
  - 2) Have ample current-carrying capacity to conduct safely any currents liable to be imposed on it; and
  - 3) Have impedance sufficiently low to facilitate the operation of the ground overcurrent devices in the circuit during fault conditions.
- i) Approved grounding conductors.



Any of the following conductors when properly installed shall be acceptable for grounding equipment to the ground field:

- 1) A properly-sized copper or other corrosion-resistant conductor which meets the requirements of Section 220.70(f);
  - 2) Rigid metal conduit;
  - 3) Electrical metallic tubing; and
  - 4) The structural metal frame of buildings.
- j) 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.
- k) Guy wire; grounding.  
Guy wires from poles supporting power lines shall be securely connected to the system ground or be provided with insulators installed near the pole end.

#### Section 220.80 Surface High-Voltage Distribution

- a) High-voltage circuits; protective devices.
  - 1) Circuit breakers protecting high-voltage circuits supplying power to portable or mobile equipment must:
    - A) be properly tested and maintained in accordance with this Section;
    - B) have adequate interrupting capacity for the circuit application as rated by the manufacturer;
    - C) be equipped with devices for protection against;
      - i) short circuit,
      - ii) overload,
      - iii) grounded phase, and
      - iv) undervoltage unless protection against undervoltage is provided on board the portable or mobile equipment receiving power from the circuit. A magnetic starter, which opens upon and must be reset manually following a loss of power, satisfies the undervoltage requirement.
  - 2) High-voltage circuits supplying power to stationary equipment must be protected from an overload or short circuit by a circuit breaker or fuses of the correct type and capacity. Circuit breakers must, in addition, on solidly grounded or resistance grounded systems, deenergize the circuit on the occurrence of a phase-to-ground fault.
  - 3) Circuit breakers and fuses must have adequate interrupting capacity rated to clear the short circuit current of the system. All electrical components and devices must be rated for the normal voltage and current of the system.
- b) Monthly testing, examination, and maintenance of circuit breakers; procedures; high-voltage.

Circuit breakers and auxiliary devices located on the surface protecting surface or underground circuits, or both, must be examined and tested at least once (1) each month by a person qualified to perform testing and calibration, or qualified to perform electrical work under Section 220.50(e) .

- 1) The examination must include observations of all readily accessible components of the circuit breaker and its auxiliary devices, and the manual activating of any of the auxiliary devices causing circuit breakers to operate. Examination of oil circuit breakers must include visual observation of all external components of the circuit breaker, including excessive oil spillage and/or the oil level of the tank. Repairs or adjustments as are indicated by such tests and examinations must be carried out immediately.
  - 2) Tests must include:
    - A) Breaking continuity of the ground check conductor where ground check monitoring is used, and
    - B) Actuating any auxiliary protective relays.
    - C) Actual system trips during the inspection interval may be used in place of the test specified in subsections (b) (2)(A) and (B) where such actual operations are maintained as part of the records.
  - 3) The operator must maintain written records of each test, examination, repair, or adjustment of all circuit breakers protecting high-voltage circuits. Such records must be kept in a book containing the following information:
    - A) The name of the person making the inspection;
    - B) The equipment inspected;
    - C) The inspected equipment's location;
    - D) The date of inspection;
    - E) The problems discovered and their corrections;
    - F) The signature of the supervisor of the person inspecting the equipment.
- c) Annual testing, examination, and maintenance of circuit breakers; procedures; high-voltage.

Circuit breakers and auxiliary devices located on the surface protecting surface or underground circuits, or both, must be tested and calibrated at the time of installation and at least annually thereafter by a person qualified to perform testing and calibration or qualified to perform electrical work under Section 220.50(e).

- 1) The annual test and examination must include:
  - A) In resistance grounded systems:
    - i) Operation of the circuit breaker by passing a sufficient amount of current through the ground fault current sensing circuit to trip the circuit breaker. The ground resistor must be checked for continuity and ohmic value,

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- ii) If ground check monitoring is used, tripping the circuit breaker by breaking continuity of the ground check conductor, or using the manufacturer's recommended test,
  - iii) Verifying all current transformer secondary circuits,
  - iv) Verifying the operation and calibration of all over-current trip devices or relays,
  - v) Verifying the operation of the circuit breaker trip system, and
  - vi) Verifying the operation of under-voltage devices where their use is required under subsection (a)(1).
- B) In ungrounded and solidly grounded systems:
- i) If ground check monitoring is used, tripping the circuit breaker by breaking continuity of the ground check conductor, or using the manufacturer's recommended test,
  - ii) Verifying the operation of all current transformer secondary circuits,
  - iii) Verifying the operation and calibration of all over-current trip devices or relays,
  - iv) Verifying the operation of the circuit breaker trip system, and
  - v) Verifying the operation of under-voltage devices where their use is required under subsection (a)(1).
- 2) Repairs, calibrations, or adjustments indicated as necessary by the examination and test required in subsection (c) must be carried out before being returned to service.
- 3) Calibrations must include adjusting all relays and associated components according to manufacturer's specifications.
- 4) An authorized representative of the Department may require additional testing or calibration of circuit breakers and auxiliary devices when it is necessary to protect the health, safety and welfare of the miners. Examples of conditions for which the Department may require additional testing or calibration include the finding of any present or repeated dangerous conditions or malfunctions, incomplete or inadequate recordkeeping, or any indication that procedures have not been followed.
- 5) The operator must maintain written records of each test, examination, repair, or adjustment of all circuit breakers protecting high-voltage circuits. Such records must be kept in a book containing the following information:
- A) The name of the person making the inspection;
  - B) The equipment inspected;
  - C) The inspected equipment's location;
  - D) The date of inspection;

- equipment.
- E) The problems discovered and their corrections;
  - F) The signature of the supervisor of the person inspecting the
- d) Grounding resistors.  
The grounding resistor, where required must be of the proper ohmic value to limit the voltage drop in the grounding circuit external to the resistor to not more than one hundred (100) volts under ground 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.
  - e) Grounding resistors; continuous current rating.  
The ground fault current rating of grounding resistors must meet the "extended time rating" set forth in Institute of Electrical and Electronics Engineers, Inc., 345 E. Forty-Seventh Street, New York City, New York 10017, Standard No. 32 (1972, reaffirmed in 1984) (The reference does not include any later amendments or editions.)
  - f) Protection of high-voltage circuits; neutral grounding resistors.
    - 1) High-voltage circuits supplying portable or mobile equipment must contain either a direct or derived neutral which must be grounded through an extended time grounding resistor at the source transformers.
    - 2) A grounding circuit, originating at the grounded side of the grounding resistor, must 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.
    - 3) The grounding circuit conductor must conform to Section 220.70(c).
    - 4) High-voltage stationary equipment may be served from impedance grounded, solidly grounded or ungrounded systems.
    - 5) Grounding transformers, where used to derive a neutral, must:
      - A) be rated for continuous phase-to-ground fault current operation; and
      - B) be located at the transformers supplying power to the circuit.
  - g) High-voltage cables; minimum design requirements.
    - 1) Cables used in high-voltage systems must be equipped with metallic shielding around each power conductor with one (1) or more grounding conductors having a total cross-sectional area of not less than one-half (1/2) the power conductor. The metallic shielding must completely enclose each individual conductor or must meet the requirements for shielding set forth in Standard WC8 of the Insulated Cable Engineers Association-National Electrical Manufacturers' Association, 2101 L. Street, N.W., Washington, D.C. 20037 for type SH or SHD portable power cables (The reference to Standard WC8 is as revised July 1987 and does not include any later revisions or amendments). Cables used as

- trailing cables must contain an insulated conductor for the ground continuity check circuit if the circuit requires a conductor.
- 2) All high-voltage cables must be rated for the intended current and voltage. Splices made in such cables must provide continuity of all components and must meet the requirements of Section 220.60(e).
- h) Cable couplers and connection boxes; minimum design requirements.
- 1) Cable couplers; requirements.
    - A) Couplers that are used in medium or high-voltage power circuits must be of the three (3)-phase type and enclosed in a full metallic shell.
    - B) Cable couplers must be rated for the intended current and voltage.
    - C) The metallic shell of cable couplers must be grounded to the grounding conductor in the cable.
    - D) Couplers must be constructed in such manner so that the ground check monitoring conductor when required will break first and the grounding conductor will break last when being uncoupled.
  - 2) Connection Boxes
    - A) Cable connection boxes must be designed and constructed to guard all energized parts from personal contact.
    - B) The box lid/plate/ door must be interlocked so that the circuit will be deenergized when opened.
    - C) The current-carrying parts must be deenergized and discharged before performing any work inside such boxes, unless the particular load carrying cable is in an isolated compartment from the rest of the connection box. In this case, only the load carrying cable need be deenergized to be worked on or removed. While deenergizing and discharging the box, protective gloves must be worn.
- i) Connection of single-phase loads.  
Single-phase loads must be connected phase-to-phase in resistance grounded systems.
- j) Installation of high-voltage transmission cables.  
High-voltage transmission cables must be installed or placed so as to afford protection against damage. They must be placed to prevent contact with low-voltage or communication circuits.
- k) High-voltage power lines; clearances above ground.  
High-voltage power lines located above driveways, haulageways, and railroad tracks must be installed so as to provide the minimum vertical clearance as specified in Rule 232 of the National Electrical Safety Code published by the Institute of Electrical and Electronics Engineers, Inc., 345 E. 47th Street, New York, New York 10017 (1981). (The reference does not include any later amendments or editions.); provided, however, that in no event shall any

high-voltage power line be installed less than fifteen (15) feet above ground, walkways, or working areas.

- l) Booms and masts; minimum distance from high-voltage lines.  
The booms and masts of equipment operated on the surface of any coal mine must not be operated within ten (10) feet of an energized overhead powerline. Where the voltage of overhead powerlines is sixty-nine thousand (69,000) volts, or more, the minimum distance from the boom or mast must be as follows:

Nominal Powerline Voltage (In 1,000 volts)	Minimum Distance Feet
69-114	12
115-229	15
230-499	25
500 or more	35

- m) 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 power line and the clearance between such equipment and powerline is less than that specified in subsection (l) for booms and masts, such power lines must be deenergized or other precautions must be taken.
- n) Operating of rear dump trucks under powerlines.  
In cases where dump trucks are operated under powerlines, the minimum vertical clearance that must be maintained over dumping areas, must be five (5) feet more than the maximum height of the truck bed measured with the truck bed in the extreme raised position.
- o) Disconnecting devices.  
Disconnecting devices must be installed at the beginning of each branch line in high-voltage circuits, except disconnecting devices in high-voltage transmission lines, which must be accessible and located as near as practicable to the entrance to the high-voltage stationary installations supplied from the overhead powerlines, and must be equipped or designed in such manner that it can be determined by visual observation that the circuit is deenergized when such devices are open.
- p) Identification of circuit breakers and disconnecting switches.  
Circuit breakers and disconnecting switches must be labeled to show which units they control, unless identification can be made readily by location.
- q) High-voltage equipment grounding.  
Low resistance ground fields used in high-voltage systems serving portable or mobile equipment must be separated from the other ground fields by twenty-five (25) feet or more.
- r) Movement of portable substation and transformers.

Portable substations, transformers, and high-voltage switch gear must be deenergized before they are moved from one location to another, and must be examined by a qualified person under Section 220.50(e) to assure safe operating condition prior to reenergization.

- s) Performing work in proximity to energized high-voltage circuits.  
Work must not be performed within four (4) feet of any exposed energized high-voltage conductor unless the provisions of subsections (v) through (dd) have been complied with, with respect to guarding of all energized conductors; except that, a person qualified under Section 220.50(e) and wearing protective lineman's gloves rated for the phase-to-phase voltage of the system, may disconnect and connect conductors to the load side of opened fused cutouts or disconnecting switches.
- t) Work on high-voltage line; deenergizing and grounding.  
High-voltage lines must be deenergized and grounded before work is performed on them, except that repairs may be permitted on energized high-voltage line if:
  - 1) Such repairs are made by a qualified person under subsection (ff) in accordance with procedures and safeguards set forth in subsection (u) through (dd) as applicable; and
  - 2) The operator has tested and properly maintained the protective devices necessary in making such repairs.
- u) Work on high-voltage line.
  - 1) A high-voltage line is not regarded as deenergized for the purpose of performing work on it, until it has been determined by a qualified person under subsection (ff) that such high-voltage line has been deenergized and grounded. Such qualified person must by visual observation:
    - A) Determine that the disconnecting devices on the high-voltage circuit are in open position; and
    - B) 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.
  - 2) Work must not be performed on any high-voltage line which is supported by any pole or structure which also supports other high-voltage lines until:
    - A) All lines supported on the pole structure are deenergized and grounded in accordance with all of the provisions of this Part which apply to the repair of deenergized surface high-voltage lines; or

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- B) The provisions of subsections(v) through (dd) have been complied with, with respect to the energized lines which are supported on the pole or structure.
  - 3) Work must not be performed on energized surface high-voltage lines except in accordance with the provisions of subsection(u) through(dd) inclusive.
  - v) Repairs to energized high-voltage lines.  
An energized high-voltage line may be repaired only when:
    - 1) The operator has determined that:
      - A) Such repairs cannot be scheduled during a period when the power circuit could be properly deenergized and grounded;
      - B) Such repairs will be performed on power circuits with a phase-to-phase nominal voltage no greater than fifteen thousand (15,000) volts;
      - C) Such repairs on circuits with a phase-to-phase nominal voltage of five thousand (5,000) volts or more will be performed only with the use of live line tools; and
      - D) Weather conditions will not interfere with such repairs or expose those persons assigned to such work to an imminent danger.
    - 2) The operator has designated a qualified person under subsection (ff) as the person responsible for carrying out such repairs and such person, in order to insure protection for himself and other qualified persons assigned to perform such repairs from the hazards of such repairs, has prepared and filed with the operator:
      - A) A general description of the nature and location of the damage or defect to be repaired;
      - B) The general plan to be followed in making such repairs;
      - C) 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;
      - D) A list of the proper protective equipment and clothing that will be provided; and
      - E) 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.
    - 3) Work performed on power lines energized at more than fifteen thousand (15,000) volts must be done in accordance with a plan submitted to and approved by the State Mine Inspector.
  - w) Work on energized high-voltage surface line; reporting.  
Any operator designating and assigning qualified persons to perform repairs on energized high-voltage surface lines under the provisions of subsection (v) must



maintain a record of such repairs. Such record must 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.

x) Simultaneous repairs.

When two (2) or more persons are working on an energized high-voltage surface line simultaneously, and any one of them is within reach of another, such person must not be allowed to work on different phases or on equipment with different potentials.

y) Installation of protective equipment.

1) Before repair work on energized high-voltage surface lines is begun, protective equipment must 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 must be installed from a safe position below the conductors or other apparatus being covered. Each rubber protective device employed in making repairs must have a dielectric strength of twenty thousand (20,000) volts or more and must comply with the provisions of the American Society for Testing and Materials (ASTM) 655 Fifteenth Street N.W.; Washington, D.C. 20005 as follows:

ITEM	ASTM STANDARD	DATE OF ADOPTION
Rubber Insulating gloves	D120-87	July 31, 1987
Rubber matting for use around electrical apparatus	D178-88	Nov. 29, 1987 Feb. 26, 1988
Rubber insulating blankets	D1048-88	Feb. 26, 1988
Rubber insulating hoods	D1049-83	June 24, 1983
Rubber insulating line hose	D1050-85	August 30, 1985
Rubber insulating sleeves	D1051-87	July 31, 1987

AGENCY NOTE: The standards do not include any later amendments or editions.

2) Protective equipment of material other than rubber must provide equal or better electrical and mechanical protection.

3) Only live line tool poles having a manufacturer's certification to withstand the following minimum tests shall be used:

A) One hundred thousand (100,000) volts per foot of length for five (5) minutes when the tool is made of fiberglass;

B) Seventy-five thousand (75,000) volts per foot of length for three (3) minutes when the tool is made of wood; or

- 4) Measuring tapes or measuring ropes containing metal must not be used when working on or near energized parts.
- z) Protective clothing; use and inspection.
- 1) All persons performing work on energized high-voltage surface lines must wear protective rubber linemen's gloves, sleeves, and climber guards if climbers are worn. Protective rubber gloves must 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 must be worn continuously from the time he leaves the ground until he returns to the ground and such person must visually inspect the equipment assigned him for defects before each use.
- 2) All rubber protective equipment used for work on energized high-voltage surface lines must be electrically tested in accordance with the American National Standards Institute and the American Society for Testing and Materials Standards (ASTM), 655 Fifteenth Street N.W.; Washington, D.C. 20005 as follows:

ITEM	ASTM STANDARD	DATE OF ADOPTION
Rubber Insulating gloves	D120-87	July 31, 1987
Rubber insulating blankets	D1048-88	Feb. 26, 1988
Rubber insulating hoods	D1049-83	June 24, 1983
Rubber insulating line hose	D1050-85	August 30, 1985
Rubber insulating sleeves	D1051-85	July 31, 1987

AGENCY NOTE: The references do not include any later editions or references.

- aa) Protective equipment; inspection.  
Each person must 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 must be discarded and replaced with proper protective equipment or clothing prior to the performance of any electrical work on such lines.
- bb) Protective equipment; testing and storage.
- 1) All rubber protective equipment used on work on energized high-voltage surface lines must be electrically tested by the operator in accordance with subsection (z)(2) and such testing must be conducted in accordance with the following schedule:
- A) Rubber gloves, once each month(except that gloves previously tested under Section 220.80(z)(2) that are not in use and have been

- kept in a storeroom or warehouse may be treated the same as new gloves);
- B) Rubber sleeves, once every three (3) months;
  - C) Rubber blankets, once every six (6) months;
  - D) Insulator hoods and line hose, once a year;
  - E) Aerial lift arm current test, before each use; and
  - F) Other electric protective equipment, once a year.
- 2) Rubber gloves must not be stored wrong side out.
  - 3) Blankets must be rolled when not in use, line hose and insulator hoods must be stored in their natural position and shape.
- cc) Operating disconnecting or cutout switches.  
Disconnecting or cutout switches on energized high-voltage surface lines must 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 must wear protective rubber lineman's gloves except where switches are bonded to a metal mat as provided in subsection (t).
- dd) 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 the protective equipment and clothing required and tested under the provisions of subsections (z),(aa), and(bb). 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.
- ee) Use of grounded messenger wires; ungrounded systems.  
Solely for purposes of grounding ungrounded high-voltage power systems, grounded messenger wires used to suspend the cable of such systems may be used as a grounding medium.
- ff) Repair of energized surface high-voltage line; qualified person.  
An individual is a qualified person for the purpose of repairing energized surface high-voltage lines, under subsections (t) through (ee) only if such person:
- 1) has had at least two (2) years experience in electrical maintenance, and
  - 2) has had at least two (2) years experience in the repair of energized high-voltage lines located on poles and structures.

(Source: Amended at 13 Ill. Reg. 5955, effective April 18, 1989)

#### Section 220.90 Low and Medium-Voltage Alternating Current Circuits

- a) Low-voltage and medium-voltage circuits serving portable, mobile and stationary, three (3)-phase alternating-current equipment; protective devices.

- 1) Low and medium-voltage circuits supplying power to portable or mobile three (3)-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 grounded phase, short circuit, and overload.
  - 2) Low and medium-voltage circuits supplying power to stationary equipment shall be deenergized with the occurrence of an overload or, short circuit, by a circuit breaker, or fuses of the correct type and capacity. Such devices shall, in addition, on solidly grounded or resistance grounded systems deenergize the circuit on the occurrence of a phase-to-ground fault. Ungrounded low and medium-voltage circuits supplying power to stationary equipment shall be provided with ground detectors to indicate visually the presence of a grounded on any phase. Other no less effective devices may be approved by an authorized representative of the Department.
- b) Testing, examination, and maintenance of circuit breaker; procedures.
- 1) Circuit breakers and their auxiliary devices shall be tested and examined at least once each month by a qualified person.
  - 2) In performing such tests, the circuit breaker auxiliaries or control circuits shall be actuated in any manner which causes the circuit breaker to open. In the absence of auxiliaries or control circuits, the breaker will be operated manually. 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.
- c) 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 (3)-phase alternating-current equipment and such record shall be kept in an approved book.
- d) Low-voltage and medium-voltage three (3)-phase circuits; system grounding.
- 1) Low-voltage and medium-voltage circuits supplying power to portable or mobile three (3)-phase alternating-current equipment shall contain:
    - A) Either a direct or derived neutral grounded through a suitable resistor as the power source; or
    - B) 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.
  - 2) Grounding resistors shall be connected to a low resistance ground field, and shall be of an CHMIC value which limits the ground fault current to no more than twenty-five (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.

- e) 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.
- f) Low-voltage and medium-voltage ground check circuits.  
Present technology does not provide for a fail safe ground monitor system. In the event such technology becomes available, The Mining Board has the authority to adopt rules requiring such systems.
- g) Systems grounding.  
Three (3)-phase low-voltage and medium-voltage circuits of more than two hundred forty (240) volts phase-to-phase extending to stationary equipment shall be grounded in one of following ways:
  - 1) Solidly grounded through a direct or derived neutral;
  - 2) Contain a direct or derived neutral grounded through a suitable resistor located at the power source; or
  - 3) Ungrounded Delta.
- h) Disconnecting devices.  
Disconnecting devices shall be installed at the beginning of each branch line supplying power to each piece of portable or mobile equipment and shall provide visual evidence that the power is disconnected.
- i) Connection of single-phase loads.  
Single-phase loads shall be connected phase-to-phase in resistance grounded systems.
- j) Qualified person.  
An individual is a qualified person within the meaning of this Section 220.90 of this Part, if such person is a qualified person under Section 220.50(e) of this Part.

#### Section 220.100 Ground Control

- a) Highwalls, pits and spoil banks; plans; filing of plan.
  - 1) Each operator shall establish and follow a ground control plan for the safe control of all highwalls, pits and spoil banks 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.
  - 2) The operator shall file a copy of such plan, and revisions thereof, with the Department, shall identify the name and location of the mine, and the name and address of the mine operator.
- b) 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; or a combination of the preceding be used to assure the safety of the workmen.

- c) 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.
- d) 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.
- e) Ground control; inspection and maintenance; general.
  - 1) Highwalls, banks, benches, and terrain sloping into the working areas shall be examined by a certified person at least once each working shift, and additionally after every rain, freeze, or thaw before men work in such areas. The examination of highwalls shall include the checking for cracks which may develop into slides. Such examinations shall be made and recorded in a book supplied by the operator and signed by the person making the examination in ink or indelible pencil. Such books shall be kept in a secure place and shall remain at the mine for a period of three (3) years.
  - 2) Overhanging highwalls and banks shall be taken down and other observed unsafe ground conditions shall be corrected promptly and no persons shall enter the hazardous area except those engaged in making the corrections. Adequate barricades or posting shall be used to keep all other persons out.
  - 3) Men shall examine their working places before starting work and frequently thereafter and any unsafe condition shall be reported immediately to the supervisor.
- f) Scaling highwalls; general.  
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.
- g) Highwalls; men working.
  - 1) Men, other than those necessary to correct unsafe conditions, shall not work near or under dangerous highwalls or banks.
  - 2) Except as provided in subparagraph (g)(3) of this Section, persons shall not work between equipment and the highwall or spoil bank where the equipment may hinder escape from falls or slides.
  - 3) Special safety precautions shall be taken when persons 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.
  - 4) Should a slide occur, a certified person with knowledge of highwalls, will examine the area of the slide for danger of more slides, and no person will

work in the area until the examination is complete and declared safe by the certified person conducting the examination. Areas on top of highwalls where persons are required to work shall be sufficiently cleared to assure safe working conditions and adequate visibility.

- h) Drilling; general.
  - 1) 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.
  - 2) Equipment defects affecting safety shall be corrected before the equipment is used.
- i) Relocation of drills; safeguards.
  - 1) 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.
  - 2) When a drill helper is used, his location shall be made known to the operator at all times when the drill is being moved.
- j) Drill; operation.
  - 1) While in operation, drills shall be attended at all times.
  - 2) Persons 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.
  - 3) Persons shall not be on a mast while the drill bit is in operation unless a safe platform is provided and safety belts are used.
  - 4) 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.
  - 5) 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.
  - 6) Where horizontal holes are drilled in the overburden, a certified person shall make a careful inspection of the face of the highwall before drilling operations begin, and all loose hazardous material shall be removed before other work is done, or the area shall be vacated and posted.
  - 7) In the event of power failure, drill controls shall be placed in the neutral position until the power is restored.
  - 8) Receptacles or racks shall be provided for drill steel stored on drills.
  - 9) Tools and other objects shall not be left loose on the mast or mast platform.
  - 10) Bit wrenches or bit knockers shall be used to remove detachable bits from drill steel.
- k) Collaring holes.
  - 1) Starter steels shall be used when collaring holes with hand held drills.

- 2) Men shall not hold the drill steel while collaring holes or rest their hands on the chuck or centralizer while drilling.
- l) Drill holes; guarding.  
Drill holes large enough to constitute a hazard shall be covered or guarded.
- m) 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.
- n) 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.

#### Section 220.110 Fire Protection

- a) 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.
- b) Escape and evacuation; plan.
  - 1) 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.
  - 2) All employees shall be instructed on current escape and evacuation plans, fire alarm signals, and applicable procedures to be followed in case of fire.
  - 3) 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.
- c) 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.
- d) Flammable liquids; storage.
  - 1) 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.
  - 2) 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.
  - 3) Fuel lines shall be equipped with valves to cut off fuel at the source and shall be located and maintained to minimize fire hazards.



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- 4) 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 twenty-five (25) feet in all directions.
  - e) 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.
  - f) Internal combustion engines; fueling.  
Internal combustion engines, except diesels, shall be shut off and stopped before being fueled.
  - g) 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.
  - h) 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.
  - i) Firefighting equipment; requirements; general.  
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.
  - j) Type and capacity of fire-fighting equipment.  
Firefighting equipment required under Section 220.110(i) shall meet the following minimum requirements:
    - 1) Waterlines. Waterlines shall be capable of delivering fifty (50) gallons of water a minute at a nozzle pressure of fifty (50) pounds per square inch. Where storage tanks are used as source of water supply, the tanks shall be of one thousand (1,000) gallon capacity for each one thousand (1,000) tons of coal processed (average) per shift.
    - 2) Fire extinguishers. Fire extinguishers shall be:
      - A) Of the appropriate type for the particular fire hazard involved;
      - B) Adequate in number and size for the particular fire hazard involved;
      - C) Replaced immediately with fully charged extinguishers after any discharge is made from an extinguisher; and
      - D) Approved by the Underwriter's Laboratories, Inc., or the Factory Mutual Research Corp., or other competent testing agency.
    - 3) Fire hose. Fire hose and couplings shall meet the requirements of the Underwriter's Laboratories', Inc., or Factory Mutual Research Corporation's specification. 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.

- k) 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:
- 1) 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.
  - 2) Preparation plants shall be equipped with water lines, 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 one hundred twenty-five (125) pound multipurpose dry powder extinguisher may be substituted for the purposes of this paragraph (k)(2) for each two thousand five hundred (2,500) square feet of floor space in a wooden or other flammable structure, or for each five thousand (5,000) square feet of floor space in a metal, concrete-block or other type of non-flammable construction.
  - 3)
    - A) Mobile equipment, including trucks, front-end loaders, bulldozers, portable welding units, and augers, shall be equipped with at least one (1) portable fire extinguisher.
    - B) Power shovels, draglines, and other large equipment shall be equipped with at least one (1) portable fire extinguisher; however, additional fire extinguishers may be required by an authorized representative of the Department.
    - C) Auxiliary equipment such as portable drills, sweepers, and scrapers, when operated more than six hundred (600) feet from equipment required to have portable fire extinguishers, shall be equipped with at least one (1) fire extinguisher.
  - 4) 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.
  - 5) Two (2) portable fire extinguishers, or the equivalent, shall be provided at each of the following combustible liquid storage installations:
    - A) Near each above ground or unburied combustible liquid storage station; and
    - B) Near the transfer pump of each buried combustible liquid storage tank.

- 6) Vehicles transporting explosives and blasting agents shall be equipped with fire protection as recommended in Code 495, Section 20, National Fire Protection Association Handbook, 12th Edition, 1962.
- l) Examination and maintenance of firefighting equipment.  
Firefighting equipment shall be maintained in a usable and operative condition. Fire extinguishers shall be examined at least once every six (6) months and the date of such examination shall be recorded on a permanent tag attached to the extinguisher.
- m) Welding, cutting, soldering; use of fire extinguisher.  
One (1) portable fire extinguisher shall be provided at each location where welding, cutting, or soldering with arc or flame is performed.
- n) Welding, cutting, or soldering with arc or flame; safeguards.
  - 1) 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.
  - 2) 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 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.
- o) Fires used for warming.  
Fires used for warming purposes shall be enclosed to prevent persons from coming in contact with flame or coals which would ignite clothing. Oily or easily ignited clothing shall not be worn where ignition hazards are present.
- p) Buildings where flammable materials are stored.  
Buildings or rooms in which oil, grease, flammable liquids, or similar flammable materials are stored shall be of fire-resistant construction and well ventilated. Provisions shall be made to control spilled flammable liquids.
- q) Storage of Combustible Materials.  
Materials, such as oily waste and rags, which are subject to spontaneous combustion shall be placed in tightly covered metal containers until disposed of properly.
- r) Flammable Solvents; Transportation.  
When flammable solvents; are used for cleaning, such solvents shall be transported in labeled safety cans of not over five (5) gallon capacity. When used to clean parts, the containers used shall have tight-fitting covers. No cleaning may be done with flammable solvents near a possible source of ignition.
- s) Oxygen cylinders; storage.  
Oxygen cylinders shall not be stored near oil or grease storage.
- t) Gauges and regulators.

Gauges and regulators used with oxygen or acetylene cylinders shall be kept clean and free of oil and grease.

- u) Valves.  
Valves on oxygen and acetylene tanks shall be kept closed when they are not in use.

#### Section 220.120 Mine Maps

The mine maps required by 30 CFR 77.1200, 77.1201, and 77.1202, shall be maintained at the mine, shall be available for inspection by authorized representatives of the Department and authorized representatives of the miners, and shall be addressed and forwarded to the Department's main office in Springfield.

#### Section 220.130 Explosives and Blasting

- a) Explosives and blasting.
  - 1) Explosives, blasting agents, detonators, or any other related blasting device or material shall be stored, transported, carried, handled, charged, fired, destroyed, or otherwise used, employed or disposed of by any person at a coal mine in accordance with all applicable provisions of existing federal and state statutes and rules, and as prescribed in the following Sections:
  - 2) The term "explosives" as used in this Part includes blasting agents. The standard in this Part in which the term "explosives" appears are applicable to blasting agents unless blasting agents are expressly excluded.
- b) Magazines; location.  
In addition to the magazine location provisions contained in existing federal and state statutes and rules, the magazine shall be located outside the blasting area.
- c) Magazine; storage.  
In addition to storage requirements contained in existing federal and state statutes and rules, the following shall apply:
  - 1) Ammonium nitrate-fuel oil blasting agents shall be separated from explosives, safety fuse, or detonating cord stored in the same magazine and in such a manner that oil does not contaminate the explosives, safety fuse, or detonating cord;
  - 2) Blasting agents may be stored in van-type trailers, provided that they are kept clean, and free of extraneous material that could create a fire hazard;
  - 3) The magazines shall be detached structures located at least fifty (50) feet away from that point or area directly beneath the powerlines;
  - 4) Areas surrounding magazines shall be kept free of rubbish and other combustibles for a distance of not less than twenty-five (25) feet in all directions;

- 5) The magazine area shall be posted with suitable danger signs which are so located that a bullet passing in the direction of the sign will not strike the magazine;
  - 6) The magazines shall be unheated unless heating can be provided in a manner that does not create a fire or explosion hazard;
  - 7) Cases or boxes containing explosives shall not be stacked more than six (6) feet high; and
  - 8) Cases of explosives shall be stored in such a manner to assure the use of the oldest stock first.
- d) Persons authorized to use explosives.
- 1) Each blasting operation shall be under the direct control person trained and experienced in the handling of explosives.
  - 2) Any person who uses or handles explosives shall be experienced in the handling of explosives; inexperienced persons shall work under the direction of and in the immediate presence of an experienced person.
- e) Transport of explosives.
- 1) Vehicles used to transport explosives, other than blasting agents, shall have substantially constructed bodies, no sparking metal exposed in the cargo space, and shall be equipped with suitable sides and tail gates; explosives shall not be piled higher than the side or end.
  - 2) Vehicles containing explosives shall be maintained in good condition and shall be operated at a safe speed and in accordance with safe operating practices.
  - 3) Vehicles containing explosives shall be posted with appropriate warning signs.
  - 4) Other materials or supplies shall not be placed on or in the cargospace of a conveyance containing explosives, except for properly secured nonsparking equipment used expressly in the handling of such explosives, detonating cord, or detonators.
  - 5) Explosives and detonators shall be transported in separate vehicles unless separated by four (4) inches of substantially fastened hardwood or an equivalent partition.
  - 6) Explosives shall be transported promptly without undue delays in transit.
  - 7) Explosives shall be transported at times and over routes that expose a minimum number of persons.
  - 8) Only the attendants necessary for safe transport shall ride in vehicles containing explosives.
  - 9) Vehicles containing detonators or explosives, other than blasting agents, shall not be left unattended except in the immediate area where loading or charging is in progress.
  - 10) When vehicles containing explosives are parked, the brakes shall be set, the motive power shut off except when in use to discharge the contents of

- the vehicle, and if parked on a grade the vehicle shall be chocked securely against rolling.
- 11) Vehicles containing explosives shall not be taken to a repair garage or shop for any purpose.
  - 12) Vehicles used to transport blasting agents to the blasting site shall have substantially constructed bodies with no zinc or copper exposed in the cargo space; where applicable, the vehicle shall be equipped with suitable sides and tailgates and the blasting agent shall not be piled higher than the sides or end enclosures. If an end screw is used to discharge the blasting agents from the vehicle, the conveyor shall be constructed to prevent development of excessive internal pressure and frictional heat in the blasting agent.
  - 13) Caution shall be exercised in the movement of vehicles in the blasting area to avoid driving the vehicle over or dragging hoses over firing lines, detonator wires, explosive materials, or loaded holes.
- f) Priming and stemming of explosives.
- 1) A primer containing an electric detonator or fused cap shall only be made up at the time of charging and as close to the blasting area as conditions allow.
  - 2) A primer containing a detonator shall be prepared to insure the detonator is securely and completely within the explosive column.
  - 3) Detonating cord shall be securely attached to the explosive forming the primer.
  - 4) Adequate priming shall be employed to minimize misfires, toxic fumes, and poor performance.
  - 5) Only nonsparking implements shall be used to punch holes in an explosive cartridge.
  - 6) Tamping poles shall be blunt and squared at one end, and made of wood, nonsparking material, or of acceptable plastic. However, where electric detonators are in use, the tamping pole shall be made of wood. All couplers shall be made on nonsparking material on both tamping machines and poles.
  - 7) No tamping shall be done directly on a primer.
- g) Firing of explosive charges.
- 1) Multiple blasts shall be fired only with instruments designed specifically for initiating electrical detonators, and having adequate capacity for the number of electrical detonators, the resistance of the blasting circuit and the type of blasting circuit used. Dry cell batteries of adequate capacity may be used for the firing of single electrical detonators, if such use has been previously approved by an authorized representative of the Department.

- 2) The control of the electrical firing device shall be entrusted only to the person authorized to fire the shots or his immediate supervisor.
  - 3) Electric detonators of different manufacturers shall not be used in the same circuit.
  - 4) Lead wires and blasting lines shall not be strung across power conductors, pipelines, railroad tracks or within fifty (50) feet of energized trailing cables or other sources of electrical contact. Twenty-five (25) feet shall be applied as a minimum distance for coal shooting.
  - 5) Electrically powered equipment and trailing cables shall be deenergized if within fifty (50) feet of boreholes containing electrical detonators or blasting circuits, and the power circuits shall not be reenergized until the shots are fired. Twenty-five (25) feet shall be applied as a minimum distance for coal shooting.
  - 6) When instantaneous blasting is performed, trunklines, in multiple-row blasts, shall make one (1) or more complete loops, with crossties between loops at intervals of not over two hundred (200) feet.
  - 7) Except when being tested with a blasting galvanometer:
    - A) Electric detonators shall be kept shunted until they are being connected to the blasting line or wired into a blasting circuit;
    - B) Wired rounds shall be kept shunted until they are being connected to the blasting line; and
    - C) Blasting lines shall be kept shunted until immediately before blasting.
  - 8) Completely wired rounds shall be tested with a blasting galvanometer before connections are made to the blasting line, and prior connection to power source.
  - 9) Blasting lines shall be properly insulated and kept in good repair.
  - 10) Charging of boreholes shall be suspended and men withdrawn from the blasting area to a safe location upon the approach and progress of an electrical storm.
- h) Detonating cord.
- 1) Delay connectors shall be treated and handled with the same safety precautions as detonators.
  - 2) Detonating cord shall not be used if it has been kinked, bent or otherwise handled in such a manner that the train of detonation may be interrupted.
  - 3) The line of detonating cord extending out of a borehole shall be cut from the supply spool after the primer is correctly positioned and the line secured.
  - 4) All detonating cord knots shall be tight and all connections shall be kept at right angles to the trunk lines.
  - 5) Blasting caps shall be crimped to fuses only with implements designed to that specific purpose.

- 6) When firing from one (1) to fifteen (15) blastholes with safety fuse ignited individually using hand-held lighters, the fuses shall be of such lengths to provide the minimum burning time specified in the following table for a particular size round:

A)

Number of holes in a round	Minimum burning time, minutes
1	2
2-5	2 2/3
6-10	3 1/3
11-15	5

B) In no case shall any forty (40) second-per-foot safety fuse less than thirty-six (36) inches long or any thirty (30) second-per-foot safety fuse less than forty-eight (48) inches long be used.

- 7) The burning rate of the safety fuse in use at any time shall be measured, posted in conspicuous locations, and brought to the attention of all men concerned with blasting.
- 8) Fuse shall not be used if it has been kinked, bent sharply, or handled roughly in such a manner that the train of deflagration may be interrupted.

i) Blasting area.

- 1) Substantial, non-conductive closed containers shall be used to carry explosives other than blasting agents. All detonators shall be kept in suitable, enclosed (non-conductive) containers prior to the use of such detonators in the work area.
- 2) Explosives shall be kept separated from detonators until charging is started.
- 3) Smoking articles, matches, lighters and open flame shall not be used within fifty (50) feet of explosives.
- 4) During the period when final preparations are being made for firing a blast, only the work activities associated with that operation shall be permitted in the blasting area.
- 5) Unused explosives, detonators, and related materials shall be moved to a safe location as soon as charging operations are completed.
- 6) Boreholes shall be stemmed immediately after loading. Whenever possible, shots shall be fired immediately after the borehole is stemmed. If shots are not fired immediately thereafter, the boreholes shall be guarded or otherwise protected as is provided in Section 220.130(i)(7) of this Part.
- A) All boreholes drilled for the purpose of blasting overburden shall be identified by number and location and logged daily in a report book kept by a certified person exclusively for these purposes.



Daily notations shall be made by the certified person responsible for the report book when shots are fired. In the event a loaded hole is not fired within twenty-one (21) days after its borehole is stemmed, such holes shall be platted on a map retained by the certified person responsible for the daily report book, which map shall be retained until all such shots are fired.

- B) Where there exists a loaded hole or holes which have not been fired, prior to the beginning of each working shift and examination of such holes shall be conducted and a report made, and such report shall be countersigned by the certified person responsible for the overall supervision of the mine.
- 7) In blast areas where final preparations are being made and holes are awaiting firing, the areas shall be guarded or barricaded and posted, or flagged against unauthorized entry.
- 8) Ample warning shall be given before blasts are fired. All persons shall be removed from the blast area.
- 9) Overburden blasting shall be conducted during daylight hours unless special permission is obtained from an authorized representative of the Department. Extra precautions shall be taken when shooting after dark. This requirement does not apply to shaft and slope sinking operations, or coal shooting.
- 10) The blasting area shall not be reentered after firing of the charges until the concentrations of smoke, dust, or fumes have reached safe limits.
- 11) For the protection of underground workers, special precautions shall be taken when blasting in close proximity to underground operations, and no blasting shall be done that would be hazardous to persons working underground.
- j) Misfires and damaged explosives.
  - 1) Damaged or deteriorated explosives shall be destroyed in a safe manner under the supervision or instructions of the explosives manufacturer.
  - 2) Misfires shall be reported to the supervisor in direct control of the blasting operations (See Section 220.130(d)(1) above), and shall be disposed of safely before any other work is performed in the blasting area.
  - 3) No person shall return to a misfired hole for at least fifteen (15) minutes.
  - 4) If explosives are suspected of burning in a hole, all persons in the blast area shall move to a safe location and no one shall return to the hole for at least one (1) hour until the danger has passed.
  - 5) Blasted areas shall be examined for undetonated explosives after each blast and undetonated explosives found shall be destroyed and disposed of in accordance with this Part.
  - 6) Holes shall not be drilled where there is danger of intersecting a charged or misfired hole.

- 7) Electric blasting shall be prohibited in the vicinity of operating radio frequency (rf) transmitters except within clearances as published in the Institute of Makers of Explosives, Publication No. 20, March 1971, "Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Electric Blasting Caps".
  - 8) Radio transmission shall be prohibited within fifty (50) feet of charged holes when blasting electrically and appropriate warning signs shall be posted.
  - 9) Blast holes in "hot-hole" areas and holes that have been sprung shall not be charged before tests have been made to insure that the heat has been dissipated to a safe level.
  - 10) Fuse and igniters shall be stored in a cool, dry place away from oils or grease.
  - 11) Fuse shall be ignited with hot-wire lighters, lead spitters, igniter cord, or other such devices designed for this purpose.
  - 12) Fuse shall not be ignited before the primer and the entire charge is securely in place.
- k) Blasting agents; special provisions.
- 1) Ammonium nitrate and the components used for the sensitizing thereof shall be stored and used in accordance with the recommendations contained in the Bureau of Mine Information Circular 8179, "Safety Recommendation for Sensitized Ammonium Nitrate Blasting Agents-1963".
  - 2) Where pneumatic loading is employed, before any type of blasting operation using blasting agents is put into effect, an evaluation of the potential hazard of static electricity shall be taken to eliminate the hazard of static electricity before blasting agent use is commenced.
  - 3) Pneumatic loading equipment shall not be grounded to waterlines, airlines, rails, or the permanent electrical grounding systems.
  - 4) Hoses used in connection with pneumatic loading machines shall be of the semiconductive type, having a total resistance low enough to permit the dissipation of static electricity and high enough to limit the flow of stray electric currents to a safe level. Wirecountered hose shall not be used.

#### Section 220.140 Man Hoisting

- a) Man hoists and elevators.  
The standards set forth in this Section, apply only to those hoists, elevators, and cable operated cranes, together with their appurtenances, that are used for hoisting men.
- b) Automatic controls and brakes.

Hoists and elevators shall be equipped with overspeed, overwind, and automatic stop controls, and with brakes capable of stopping the hoist or elevator when fully loaded.

- c) Rated capacity.  
Hoists and elevators shall have rated capacities consistent with the loads handled and the recommended safety factors of the ropes and cables used.
- d) Ropes and cables; specifications.  
The American National Standards Institute "Specifications for the Use of Wire Ropes for Mines", M 11.1-1960, or the latest revision thereof, shall be used as a guide in the use, selection, installation, and maintenance of wire ropes used for hoisting.
- e) Maximum load; posting.  
The operator shall designate the maximum number of men permitted to ride on each hoists or elevator at one time. This limit shall be posted on each hoist and elevator and on each landing.
- f) Inspection and maintenance.
  - 1) Procedures shall be adopted for the uniform daily inspection of all electric hoists, cages, guides, and other equipment associated with the hoisting and lowering of men. Such examinations shall include, but not be limited to, the following:
    - A) A visual examination of the rope for wear, broken wires, and corrosion, especially at excessive strain points;
    - B) An examination of the rope fastenings for defects;
    - C) An examination of the elevator for loose, missing, or defective parts;
    - D) An examination of sheaves for broken flanges, defective bearings, rope alignment, and proper lubrication; and
    - E) An examination of the automatic controls and brakes required under Section 220.140(b).
  - 2) A report of the daily examinations shall be signed by the person making such examination and the report shall be signed or countersigned by any of the persons listed in Section 220.170(o)(4).
  - 3) Empty conveyances shall be operated at least one (1) round trip before hoisting men after any repairs.
  - 4) Alterations or changes in a hoist or elevator which might affect its rated capacity shall be made only with the approval of an authorized representative of the Department.
  - 5) The ropes and cables of hoists and elevators shall be kept well lubricated from end to end as recommended by the manufacturer.
- g) Hoists and cranes; operations.

Hoists and cranes shall be under the control and operated by an experienced operator when persons are being transported, except for automatically operated equipment.

(Source: Amended at 4 Ill. Reg. 48, p. 220, effective December 17, 1980)

#### Section 220.150 Auger Mining

- a) Auger mining; planning.

Auger mining shall be planned and conducted by the operator to insure against any hazard to underground workings or future underground workings located at or near such auger operations and all auger holes shall be located so as to prevent:

  - 1) The disruption of the ventilation system of any active underground mine;
  - 2) Inundation hazards from surface water entering any active underground mine;
  - 3) Damage to the roof and ribs of active underground workings; and
  - 4) Intersection of auger holes with underground mine workings known to contain dangerous quantities of impounded water.
- b) Auger mining; inspection.
  - 1) The face of all highwalls, to a distance of fifty (50) feet on both sides of each drilling site, shall be inspected by a certified person before any augering operation is begun, and at least once (1) during each coal producing shift and all loose hazardous material shall be removed from the drilling site before persons are permitted to enter the drilling area. The results of all such inspections shall be recorded daily in an approved book.
  - 2) In addition, the face of all highwalls, to a distance of fifty (50) feet on both sides of each drilling site, shall be inspected frequently by a certified person during any auger operation conducted either during or after a heavy rainfall or during any period of intermittent freezing and thawing, and the results of such inspections shall be recorded as provided in paragraph (b)(1) of this Section.
  - 3) When an auger hole penetrates an abandoned or mined out area of an underground mine, tests for methane and oxygen deficiency shall be made at the collar of the hole by a qualified person using an approved device to determine if dangerous quantities of methane or oxygen-deficient air are present or being emitted. If methane or oxygen-deficient air is found, no further work shall be performed until the atmosphere has been made safe.
  - 4) Tests for oxygen deficiency shall be conducted with a permissible flame safety lamp or other approved means and all tests for methane shall be conducted with an approved methane detector.
  - 5) Internal combustion engines shall not be operated in the vicinity of any auger hole in which tests for methane or oxygen deficiency are being made.

- c) Auger holes; restriction against entering.  
No person shall be permitted to enter an auger hole except with the approval of an authorized representative of the Department, which representative has inspected such hole and has determined that it is safe for entering.
- d) Augering equipment; overhead protection.
  - 1) Auger machines which are exposed to highwall hazards together with all those parts of any coal elevating conveyors where persons are required to work during augering operation, shall be covered with heavy gauge screen which does not obstruct the view of the highwall and is strong enough to prevent injuries to workmen from falling material.
  - 2) No work shall be done under any overhang and when a crew is engaged in connecting or disconnecting auger sections under a highwall, at least one (1) person shall be assigned to observe the highwall for possible movement.
- e) Auger equipment; operation.
  - 1) Persons shall be kept clear of the auger train while it is in motion and shall not be permitted to pass under or over an auger train, except where adequate crossing facilities are provided.
  - 2) Persons shall be kept clear of auger sections being swung into position.
  - 3) No person, including the auger machine operator, shall, where practicable, be stationed in direct line with a borehole during augering operations.
  - 4) Operators of auger equipment shall not leave the controls of such equipment while the auger is in operation.
  - 5) Adequate illumination shall be provided for work areas after dark.
- f) Auger holes; blocking.  
Auger holes shall be blocked with highwall spoil or other suitable material before they are abandoned.
- g) Highwall; vicinity of augering equipment.  
No work shall be done on the highwall in the vicinity of augering equipment while it is in operation.
- h) Maps.
  - 1) Two (2) or more adjacent mines shall not be intersected without the express approval of the Mining Board. If two (2) or more companies make such a request for approval of such a project, a plan for intersecting such mines shall be submitted to the Mining Board for approval. Such plan shall specify the reasons for the proposed intersection, and shall include information regarding the following:
    - A) Whether the mines proposed to be intersected are surface, shaft or auger mines;
    - B) Whether there is any water impounded at the affected existing mines;

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- C) Whether the mines are abandoned; and
  - D) Whether any reclamation has been performed at the affected mines, and the year in which such reclamation was performed.
- 2) The conditions of any underground mine being intersected by auger mining shall be noted in the request. If there is water in the abandoned underground mine, a clear proposal shall be made for how water or gases will be controlled both before and after the proposed intersecting operations are to be done, and accurate maps of same shall be furnished to the Department when submitting requests for mining into active mines. All applicable federal and state statutes and rules shall be complied with. The District State Mine Inspector shall be notified and be present when the initial intersecting with underground mines is performed, and may stop the auger at any time that hazards are noted by him.
  - 3) Auger mining shall not be done any nearer than fifty (50) feet to the boundary of an active underground mine, unless the work is coordinated with the consent of both companies and according to this Part. The proposed plan shall be made showing all preparations made in the underground mine to guard against any changes or interruptions in ventilation.
  - 4) Maps of both the adjoining mines must be submitted to the Department with all requests for intersecting two (2) mines whether they be surface mines or surface and underground mine every six (6) months. Maps must be on the same scale, showing quarter sections, county, township, name of mines involved, a profile drawing and measurements in feet and decimals thereof. The rise and dip of the bottom of the coal seam in both mines. A contour overlay must be included with all requests. Maps must be no smaller than one hundred (100) feet to one (1) inch. Maps must have north plainly marked, must be signed by an engineer registered by the State of Illinois with his or her registration number noted. Maps must show the depth of penetration of auger and size of auger used or proposed to be used.
  - 5) The depth and penetration, directions of auger holes shall be platted on a map showing all adjacent mined areas. This map shall be kept current at the end of each shift by a certified person and made available to the District State Mine Inspector and interested persons.
  - 6) An accurate map of all auger mined areas, showing railroads, highways, and structures which may be affected by mining will be furnished. It shall show all active and abandoned surface mines, all active and abandoned underground mines, and all water impoundments, rivers, and streams. This may be done with a map and an overlay or transparent which must be accurate and on the same scale as the map. All maps must be submitted to the Department every six (6) months by an engineer registered by the State

of Illinois with a registration number legibly printed on the legend, which must include a complete description of location of the mining.

Section 220.160 Loading and Haulage

- a) Loading and haulage; general.
  - 1) Only authorized persons shall be permitted on haulage roads and at loading or dumping locations.
  - 2) Traffic rules, signals, and warning signs shall be standardized at each mine and posted.
  - 3) 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.
  - 4) All active access and haulage roads will be kept in safe condition, reasonably free of holes, mud, snow, ice, and other dangerous conditions.
  - 5) All two (2)-way haulage roads will be constructed so they will have a running surface a minimum of three (3) times the width of the widest piece of haulage equipment traveling the road, including all ramps and inclines into the pit.
  - 6) When haulage roads cross a road used by the public, two hundred (200) feet of unobstructed vision from the intersection must be maintained for mobile equipment and all other vehicles used by mine personnel. Traffic controls shall be established at the intersection.
  - 7) Where adequate visibility is not provided, and where deemed necessary by a representative of the Department, a signal light shall be installed where a haulage road crosses railroad tracks.
- b) 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:

  - 1) Dippers, shovels, buckets, forks, and clamshells;
  - 2) The cargo space of dump trucks or haulage equipment used to transport coal or other material;
  - 3) Outside the cabs and beds of mobile equipment;
  - 4) Chain, belt, or bucket conveyors, except where such conveyors are specifically designed to transport persons; and
  - 5) Loaded buckets on aerial tramways.
- c) Use of aerial tramways to transport persons.

Persons other than maintenance men shall not ride empty buckets on aerial tramways unless the following features are provided:

  - 1) Two (2) independent brakes, each capable of holding the maximum load;
  - 2) Direct communication between terminals;

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- 3) Power drives with emergency power available in case of primary power failure; and
  - 4) Buckets equipped with positive locks to prevent accidental tripping or dumping.
- d) Trains and locomotives; authorized persons.
- 1) Only authorized persons shall be permitted to ride on trains or locomotives and they shall ride in a safe position.
  - 2) Men shall not get on or off moving equipment, except that trainmen may get on or off of slowly moving trains.
- e) Transportation of persons; overcrowding.
- 1) 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.
  - 2) 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.
  - 3) Man-trip vehicles shall be provided with adequate heat, ventilation, and maintained so as to provide the best possible protection of the riders.
  - 4) At no time will man-trip vehicles hauling riders exceed forty (40) miles per hour.
  - 5) Each man-trip compartment shall have two (2) separate means of escape.
- f) Loading and haulage equipment; installations.
- 1) Cab windows shall be of safety glass or equivalent, in good condition and shall be kept clean.
  - 2) Mobile equipment shall be equipped with adequate brakes, and all trucks and front-end loaders shall also be equipped with parking brakes.
  - 3) Positive-action type brakes shall be provided on aerial tramways.
  - 4) Mobile equipment shall be provided with audible warning devices. Lights shall be provided on both ends when required.
  - 5) Guard nets or other suitable protection shall be provided where tramways pass over roadways, walkways, or buildings.
  - 6) Guards shall be installed to prevent swaying buckets from hitting towers.
  - 7) Aerial tramway cable connections shall be designed to offer minimum obstruction to the passage of wheels.
  - 8) Rocker-bottom or bottom-dump cars shall be equipped with positive locking devices, or other suitable devices.
  - 9) Ramps and dumps shall be of solid construction, of ample width, have ample clearance and headroom, and be kept reasonably free of spillage.
  - 10) Chute-loading installations shall be designed so that the men pulling chutes are not required to be in a hazardous position during loading operations.
  - 11) Berms or guards shall be provided on the outer bank of elevated roadways.



- 12) Berms, bumper blocks, safety hooks, or similar means shall be provided to prevent overtravel and overturning at dumping locations.
  - 13) 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.
  - 14) Where practicable, a minimum of thirty (30) inches continuous clearance from the farthest projection of moving railroad equipment shall be provided on at least one (1) side of the tracks; all places where it is impossible to provide thirty (30) inch clearance shall be marked conspicuously.
  - 15) Track guardrails, lead rails, and frogs shall be protected or blocked so as to prevent a person's foot from becoming wedged.
  - 16) Positive-acting stop-blocks, derail devices, track skates, or other adequate means shall be installed wherever necessary to protect persons from run-a-way or moving railroad equipment.
  - 17) Switch throws shall be installed so as to provide adequate clearance for switchmen.
  - 18) Where necessary, bumper blocks or the equivalent shall be provided at all track dead ends.
  - 19) All coal cars will be inspected for broken steps, platforms, brake wheels and adequate brakes before handled by car droppers or load riders.
  - 20) All railroad beds, rails, ties, joints, switches, frogs, and other elements on a railroad shall be kept clean of spilled coal, mud, weeds, and be provided with good drainage so ties can be visually inspected for decay and visual inspection can be made for loose joints, spikes, and proper gauge.
  - 21) Whenever practical rail cars will be positioned so the brakes are on the back of the cars when men are required to operate hand brakes.
- g) Loading and haulage equipment; inspection and maintenance.
- 1) Mobile loading and haulage equipment shall be inspected by a person competent to conduct such inspections before such equipment is placed in operation. Equipment defects affecting safety shall be recorded and reported to the operator, and such defects shall be repaired. Such records shall be available for inspection by State Mine Inspectors and the authorized representative of the miners.
  - 2) 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, and such defects shall be repaired.
  - 3) Equipment defects affecting safety shall be corrected before the equipment is used.
- h) Loading and haulage equipment; operation.

- 1) Vehicles shall follow at a safe distance; passing is prohibited on hills, curves, at intersections, at railroads, in congested areas, and other areas where clearance and visibility is inadequate.
- 2) Mobile equipment operators shall have full control of the equipment while it is in motion.
- 3) Equipment operating speeds shall be prudent and consistent with conditions of roadway, grades, clearance, visibility, traffic, and the type of equipment used.
- 4) Cabs of mobile equipment shall be kept free of extraneous materials.
- 5) Operators shall sit facing the direction of travel while operating equipment with dual controls.
- 6) When an equipment operator is present, men shall notify him before getting on or off equipment.
- 7) Equipment operators shall be certain, by signal or other means, that all persons are clear before starting or moving equipment.
- 8) Where possible, aerial tramways shall not be started until the tramway operator has ascertained that everyone is in the clear.
- 9) Dust control measures shall be taken where dust significantly reduces visibility of equipment operators.
- 10) 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.
- 11) Men shall not work or pass under the buckets or booms of loaders in operation.
- 12) 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.
- 13) 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.
- 14) Lights, flares, or other warning devices shall be posted when parked equipment creates a hazard to vehicular traffic.
- 15) Dippers, buckets, scraper blades, and similar movable parts shall be secured or lowered to the ground when not in use.
- 16) Shovel trailing cables shall not be moved with the shovel dipper unless cable slings or sleds are used.
- 17) Equipment which is to be hauled shall be loaded and protected so as to prevent sliding or spillage.
- 18) When moving between work areas, the equipment shall be secured in the travel position.

- 19) Any load extending more than four (4) feet beyond the rear of the vehicle body should be marked clearly with a red flag by day and a red light at night.
- 20) Tow bars shall be used to tow heavy equipment and a safety chain shall be used in conjunction with each tow bar. When heavy equipment is to be towed, the towing vehicle shall be of suitable weight and strength to maintain safe control of the load.
- 21) 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.
- 22) Railroad cars shall not be coupled or uncoupled manually unless the railroad and cars are so designed to eliminate any hazard from coupling or uncoupling cars. All persons manually applying brakes on moving rail cars shall step to the side ladder of the car before coupling.
- 23) Persons shall wear safety belts when dropping railroad cars.
- 24) Railcars shall not be left on sidetracks unless ample clearance is provided for traffic on adjacent tracks.
- 25) Parked railcars, unless held effectively by brakes, shall be blocked securely.
- 26) Railroad cars and all trucks shall be trimmed properly when they have been loaded higher than the confines of their cargo space.
- 27) 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. Conveyors shall be locked out or otherwise rendered inoperable and tagged with a "Do Not Operate" tag prior to repairs.
- 28) Unguarded conveyors with walkways shall be equipped with emergency stop devices or cords along their full length. Conveyor emergency stop switches shall be designed so that a conveyor cannot be started until the activating stop switch has been reset to the running or "on" position. All conveyor controls, including emergency stop devices, shall be distinctly identified.
- 29) 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.
- 30) Aerial tram conveyor buckets shall not be overloaded, and feed shall be regulated to prevent spillage.
- 31) Cabs of mobile equipment shall be provided with a properly secured extra seat where possible when training people to operate such equipment.

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- i) Handling, storage and repair of large pneumatic tires
- 1) Before performing any work on a vehicle requiring removal of the tire and wheel assembly from the axle shaft or removal of any rim components, such as rim clamps or lug nuts, from a wheel equipped with split rims or locking rings, a visual inspection of the tire and rim assembly must be conducted. If any defect, damage or improper seating of the tire or rim components is noted, or if the tire or rim assembly is to be removed from service, the tire must be completely deflated before any removal work is begun.
  - 2) If no defect, damage or improper seating of the tire or rim component is noted and the tire and rim assembly are intended to be kept in service, the following requirements apply depending on the work to be done:
    - A) if the work to be performed requires the removal of rim components, such as rim clamps or lug nuts, the tire must be deflated to the lowest pressure which will maintain the seal and locking of the tire to the rim in accordance with the manufacturer's specifications before any removal work is begun.
    - B) if the work to be performed (e.g. brake repair, wheel bearing repair) requires the removal of the tire and wheel assembly, but does not entail removal of rim components such as rim clamps or lug nuts, the tire and wheel assembly is not required to be deflated but must be secured to the conveyance with which it is removed from the vehicle.
  - 3) On any dual tire and wheel assembly, the inspection and deflation requirements must be performed on both wheels before the removal of any rim components from either wheel, but a separately locked inside wheel, unless required to be deflated as a result of the inspection, need not be deflated if only the outside wheel is to be removed.
  - 4) Tires installed on split rims or rims equipped with locking rings that have been removed from vehicles and repaired or replaced shall be protected by a safety tire rack, cage, or equivalent protection while being inflated if inflation is performed off the vehicle. No person shall position himself in front of a tire being inflated on or off the equipment.
  - 5) No tire greater than twenty (20) inches inside diameter and more than twelve (12) ply shall be removed from or remounted on a rim in or about a central mine shop, surface or underground, without the use of mechanical equipment designed to remove tires from rims or to remount tires on the rims.
  - 6) A specific safe isolated area for the operator of tire changing equipment shall be supplied in or about any central mine shop of any surface or underground mine.

- 7) If tires are dismounted or mounted at central mine shops, surface or underground, the area in which this work is performed shall be isolated from all other work areas in the shop.
- 8) All persons engaged in inflating tires in central mine shops, surface or underground, shall do so in an area isolated from other workmen, except those workmen performing work on tires.
- 9) For the purpose of subsections (7) and (8), "isolated" means that the area is situated or barricaded such that persons other than workers performing work on tires are not permitted to enter or be within the potential area of trajectory of any explosive forces which might be released during any work on tires and rim assemblies.
- 10) When a tire has been removed from a rim assembly and before the tire or rim is returned to service, an inspection of all components must be conducted. Rim flanges, rim gutters, rings, bead seating surfaces and bead areas must be thoroughly cleaned and visually inspected for cracks, bends, and pitting. If any conditions are found that affect the safe use of the rim or rim components, the rim or rim components shall be removed from service. The operator shall make a record of the inspection of each tire and rim assembly which is to be returned to service in a book kept for that purpose. The record shall be signed and include the date of inspection, and an identifying number or other marking which shall also be affixed to and remain on the tire and rim assembly from the time of inspection until installation on a vehicle. If the operator uses an independent contractor for servicing tires and rim assemblies, the operator must verify that the provisions of this Subsection (10) have been complied with prior to entering and signing the record, unless the record is entered and signed by an authorized agent or employee of the independent contractor.
- 11) Cutting, welding, brazing or heating of any multi-piece rim assembly is prohibited except for the repair or replacement of wheel stops or lugs, and then only with the tire removed from the rim. Cutting, welding, brazing or heating on single-piece rims is permissible subject to the following conditions:
  - A) the tire must be removed from the rim;
  - B) the crack or other defect to be welded must not exceed six (6) inches in length;
  - C) the crack or other defect to be welded must not extend closer than six (6) inches to either of the outsides of the rim;
  - D) welding must be performed by a person qualified in accordance with the Structural Welding Code - Steel (ANSI/AWS D1.1-90) published by the American Welding Society, 550 N.W. LeJeune Road, P.O. Box 351040, Miami, Florida 33135 (the reference is to

- the Twelfth edition, effective January 1, 1990 and does not include any later editions or references); and
- E) the welded area must be sounded with an ultrasonic testing instrument to determine the adequacy of the weld before the rim is returned to service.
- 12) here shall be supplied at all tire airing stations a clip-on air chuck with no less than ten (10) feet of air hose from the valve stem to the inflator gauge.
  - 13) No person shall be allowed to inflate tires at any mines from oxygen or acetylene supply tanks.
  - 14) Tires greater than twenty (20) inches inside diameter, if stored lying flat shall be stored to a depth no greater than two tires or five feet. Tires greater than twenty (20) inches inside diameter, if stored upright, must be secured to prevent falling.
- j) Dumping facilities.
- 1) Dumping locations and haulage roads shall be kept reasonably free of water, debris, and spillage.
  - 2) 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.
  - 3) Adequate protection shall be provided at dumping locations where persons may be endangered by falling material.
  - 4) Grizzlies, grates, and other sizing devices at dump and transfer points shall be anchored securely in place.
  - 5) Where trucks are backing into dumping or loading position and the operator cannot see openings or edges of coal rib or bench, another person shall be assigned to direct trucks. Lights shall be used at night to help direct the truck operator. A person used to spot trucks shall be well in the clear.
  - 6) When hopper is not being used, proper barricades will be installed to protect anyone from falling or driving into opening.

(Source: Amended at 15 Ill. Reg. 1006, effective January 14, 1991)

#### Section 220.170 Miscellaneous

- a) Communication in work areas.  
No employee shall be assigned, allowed or required to perform work alone in any area where conditions exist that would endanger his safety unless he can communicate with other, can be heard, or can or will be seen at predetermined intervals.
- b) Emergency communications; requirements.

- 1) Each operator of a surface coal mine shall establish and maintain a communication system from the mine to the nearest point of medical assistance for use in an emergency.
  - 2) The emergency communication system required to be maintained under paragraph (b)(1) of this Section may be established by telephone or radio transmission or by any other means of prompt communication to any facility (for example, the local sheriff, the State Highway Patrol, or local hospital) which has available the means of communication with the person or persons providing emergency medical assistance or transportation in accordance with the provisions of paragraph (b)(1) of this Section.
- c) Arrangements for emergency medical assistance and transportation for injured person; reporting requirements; posting requirements.
- 1) Each operator of a surface coal mine shall make arrangements with a licensed physician, medical service, medical clinic, or hospital to provide twenty-four (24) hour emergency medical assistance for any person injured at the mine.
  - 2) Each operator shall make arrangements with an ambulance service, or otherwise provide for twenty-four (24) hour emergency transportation for any person injured at the mine.
  - 3) Each operator shall, immediately after making an arrangement required under the provisions of paragraphs (b)(1) and (b)(2) of this Section, of immediately after any change, of such agreement, post at appropriate places at the mine the names, titles, addresses, and telephone numbers of all persons or services currently available under such arrangements to provide medical assistance and transportation at the mine.
  - 4) Wherever possible the shortest access route from public roads shall be provided and maintained to and from work areas for the ambulance service.
- d) First aid training; supervisory employees.  
Each operator of a surface coal mine shall conduct a first aid training course for selected supervisory employees at the mine and report on such training course in writing to the representative of the Department.
- e) First aid training program; Availability of instruction to all miners.  
Each operator of a surface coal mine shall make available to all miners employed in the mine a course of instruction in first aid conducted by the operator or under the auspices of the operator, and such a course of instruction shall be made available to newly employed miners within six (6) months after the date of employment.
- f) First aid training program; retraining of supervisory employees; availability to all miners.

Each operator of a surface coal mine shall conduct refresher first aid training programs each calendar year for all selected supervisory employees and make available refresher first aid training courses to all miners employed in the mine.

- g) First aid training program; minimum requirements.
  - 1) All first aid training programs required under the provisions of Sections 220.170(d) and 220.170(e) shall include ten (10) class hours of training in a course of instruction similar to that outlined in "First Aid, a Bureau of Mines Instruction Manual".
  - 2) Refresher first aid training programs required under the provisions of Section 220.170(f) shall include five (5) class hours of refresher training in a course of instruction similar to that outlined "First Aid, a Bureau of Mines Instruction Manual".
- h) First aid equipment; location; minimum requirements.
  - 1) Each operator of a surface coal mine shall maintain a supply of the first aid equipment set forth in paragraph (h)(2) of this Section at or near each working place where coal is being mined, at each preparation plant and at shops and other surface installations where ten (10) or more persons are regularly employed.
  - 2) The first aid equipment required to be maintained under the provisions of paragraph (h)(1) of this Section shall include at least the following:
    - A) One (1) stretcher;
    - B) One (1) broke-back board (if a splint-stretcher combination is used it will satisfy the requirements of both paragraphs (h)(2)(A) and (h)(2)(B) of this Section);
    - C) Twenty-four (24) triangular bandages fifteen (15) if a splint-stretcher combination is used;
    - D) Eight (8) four (4) inch bandage compresses;
    - E) Eight (8) two (2) inch bandage compresses;
    - F) Twelve (12) one (1) inch adhesive compresses;
    - G) An approved burn remedy;
    - H) Two (2) cloth blankets;
    - I) One (1) rubber blanket or equivalent substitute;
    - J) Two (2) tourniquets;
    - K) One (1) one (1) ounce bottle of aromatic spirits of ammonia or one (1) dozen (12) ammonia ampules; and
    - L) The necessary compliments of arm and leg splints or two (2) each inflatable plastic arm and leg splints.
  - 3) All first aid supplies required to be maintained under the provisions of paragraphs (h)(1) and (h)(2) of this Section shall be stored in suitable, sanitary, dust tight, moisture proof containers and such supplies shall be accessible to the miners.
- i) Safety program; instruction of persons employed at the mine.



Each operator of a surface coal mine shall establish and maintain a program of instruction with respect to the safety regulations and procedures to be followed at the mine and shall publish and distribute to each employee, and post in conspicuous places throughout the mine, all such safety regulations and procedures established in accordance with the provisions of the Section.

- j) Safety training; inexperienced employees.  
New employees shall be indoctrinated in safety rules and safe work procedures and inexperienced employees shall not be assigned to work duties until they have been trained thoroughly in safe work procedures related to the assigned work duties.
- k) 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:
  - 1) 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;
  - 2) Suitable protective clothing to cover the entire body when handling corrosive or toxic substances or other materials which might cause injury to skin;
  - 3) 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;
  - 4) A suitable hard hat or hard cap when in or around a mine or plant. If a hard hat or hard cap is painted, nonmetallic based paint shall be used;
  - 5) Suitable protective footwear;
  - 6) Snug-fitting clothing without loose ends when working around moving machinery or equipment;
  - 7) 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;
  - 8) Lifejackets or belts where there is danger from falling into water; and
  - 9) Seatbelts in a vehicle where there is a danger of overturning and where roll protection is provided.
- l) 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 (1) year from the date of his initial employment as a miner.
- m) Smoking prohibition.

No person shall smoke or use an open flame where such practice may cause a fire or explosion.

- n) Reopening mines; notification; inspection prior to mining.  
Prior to reopening any surface coal mine after it has been abandoned or declared inactive by the operator, the operator shall notify the Director. An inspection of the entire mine shall be completed by an authorized representative of the Department before any mining operations in such mine are instituted.
- o) Daily inspection of surface coal mine; certified or competent person; reports of inspection.
  - 1) All inspections, examinations, or checks required by these rules, or the statutes of the State of Illinois shall be made by a certified person. At least once during each working shift, or more often if necessary for safety, each active working area and each active surface installation shall be examined by a certified person designated by the operator to conduct such examinations for hazardous conditions. Any hazardous conditions noted during such examinations shall be reported to the operator and shall be corrected by the operator.
  - 2) If any hazardous condition noted during an examination conducted in accordance with paragraph (o)(1) of this Section creates an imminent danger, the person conducting such examination shall notify the operator and the operator shall withdraw all persons from the area affected, except those persons necessary to correct the danger, until the danger is abated.
  - 3) After each examination, inspection, or check conducted in accordance with the provisions of paragraph (o)(1) of this Section, each certified person who conducted all or any part of the examination required shall enter and sign with ink or indelible pencil in an approved book the date and a report of the condition of the mine or any area of the mine which he has inspected together with a report of the nature and location of any hazardous condition found to be present at the mine. The book in which such entries are made shall be kept in an area at the mine designated by the operator to minimize the danger of destruction by fire or other hazard.
  - 4) All examination reports recorded in accordance with the provisions of paragraph (o)(3) of this Section shall include a report of the action taken to abate hazardous conditions and shall be countersigned each day by at least one (1) of the following certified persons:
    - A) A Surface Mine Foreman;
    - B) The Assistant Superintendent of the mine;
    - C) The Superintendent of the mine; or
    - D) The person designated by the operator as responsible for health and safety at the mine.
- p) Major repair work; supervision.

When major repair work is being done, a company supervisor will be present to see and direct the work in a safe manner. The supervisor and the user shall inspect all tools, slings, chains, and other equipment being used to perform the work to see they are in safe working condition and free of safety defects.

- q) Marine operations and equipment.
- 1) All operators shall have sufficient personnel available to conduct water rescue operations when persons are working near water. Such personnel shall be trained in the Standard United States Coast Guard approved water rescue operations, and capable of operating all the rescue equipment required by these, and any other, applicable federal and state statutes and rules.
  - 2) Unless employees can step safely to or from the wharf, float, barge, or river towboat, a safe walkway shall be provided.
  - 3) Decks or other working surfaces shall be maintained in a safe condition.
  - 4) Persons shall not pass fore or aft, over, or around deckloads, unless a safe passage is provided.
  - 5) The employer shall have in the vicinity of the barge at least one (1) U.S. Coast Guard approved thirty (30) inch life ring with not less than ninety (90) feet of line attached, and at least one (1) portable or permanent ladder which will reach from the top of the apron to the surface of the water shall be provided in the vicinity of the barge.
  - 6) Surface of the barge where men work and walk must be clear of snow, ice, or any other substance that might make footing unsafe.
  - 7) In certain situations where the boat pilot cannot see the deck hands or hand, a means of communication must be established.
  - 8) A boat and motor with safety equipment necessary to rescue a person or persons, will be kept in ready condition at all times when mining operations are conducted in or adjacent to navigable waterways.
  - 9) The person assigned by the operator to supervise mining operations conducted in or adjacent to navigable waterways will not permit anyone on the towboat or barges without a U.S. Coast Guard-approved life jacket. Such assigned person will not move the towboat until all persons comply.
- r) State mine inspectors; notification of miners' representative prior to inspection and posting of findings and recommendations. On each visit to a mine, the State Mine Inspector shall notify a representative of the miners that he is there to make an inspection so that the miners' representatives may accompany him if they so desire. Following each inspection, the Inspector shall meet with management and representatives of the miners at the request of either or both of them to discuss his findings and recommendations. His findings and recommendations together with the time provided to comply shall be posted in a conspicuous place following each inspection. The length of time to comply will be based upon the nature and severity of the infraction(s) noted.

(Source: Added at 4 Ill. Reg. 48, p. 220, effective December 17, 1980)

Section 220.180 Trolley Wires and Trolley Feeder Wires

- a) Cutout switches.  
Trolley wires and trolley feeder wires, shall be provided with cutout switches at intervals of not more than two thousand (2,000) feet and near the beginning of all branch lines.
- b) Overcurrent protection.  
Trolley wires and trolley feeder wires shall be provided with overcurrent protection.
- c) 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 Section 220.180(b).
- d) Insulation of trolley wires, wires; guarding of trolley wires and trolley feeder wires, and bare signal trolley feeder wires.
  - 1) 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.
  - 2) The authorized representative of the Department 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.

Section 220.190 Slope and Shaft Sinking

- a) Slopes and Shafts; approval of plans.  
Each operator of a coal mine shall comply with Subpart T, Section 77.1900 of the Code of Federal Regulations, Title 30-Mineral Resources, and any amendments, additions, and alterations which may be made with respect to any Section of such subpart at any time subsequent to the filing of these Surface Installation Health and Safety Rules (62 Ill. Adm. Code 220), in preparing any slope and shaft sinking plan, and a copy of such approved plan shall be furnished to the Illinois Department of Natural Resources, Office of Mines and Minerals for the approval of the Mining Board.
- b) Compliance with approved slope and shaft sinking plans.  
Upon approval by the Mining Board of a slope or shaft sinking plan, the operator shall adopt and comply with same.
- c) Preshift and onshift inspections; reports.

- 1) Examinations of slope and shaft areas shall be made by a certified shaft-slope examiner for hazardous conditions, including tests for methane and oxygen deficiency:
    - A) Within ninety (90) minutes before each shift;
    - B) At least once (1) on any shift during which men are employed inside any slope or shaft; and
    - C) Both before and after blasting.
  - 2) 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.
  - 3) 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, except those persons necessary to correct those hazards. 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 operation until the hazardous condition has been corrected.
  - 4) 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.
  - 5) Nothing in this Section shall prevent the specific assignment of persons in the slope or shaft for purpose of abating excessive methane concentrations or any other hazardous condition.
  - 6) The results of all inspections conducted in accordance with this Section shall be recorded daily in a book approved by the Department of Natural Resources, Office of Mines and Minerals, and shall be signed by the person making the inspection and shall be countersigned after each examination by a certified shaft-slope supervisor.
- d) 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 Department of Natural Resources, Office of Mines and Minerals, and tests for methane shall be made with a methane detector approved by the Department of Natural Resources, Office of Mines and Minerals, or a flame safety lamp.
- e) Diesel powered equipment.  
The use of diesel powered equipment underground in shaft and slope sinking operations shall be prohibited. This regulation shall prevail until a final determination has been made by qualified doctors and scientists that there are no injurious effects on workmen engaged in duties requiring the use of diesel powered equipment in slopes and shafts, and until such time that facts of the study currently being jointly conducted by the National Institute for Occupational Health and Safety and the Mining Enforcement and Safety Administration of the United

States Department of the Interior are conclusive. At the time when such studies are completed and conclusive with regard to the potential of such injurious effects on workmen, the Mining Board shall reconsider the advisability of the use of such equipment.

- f) Hoists and hoisting; minimum requirements; requirement of compliance with existing statutes and rules.
  - 1) Hoists shall include all hoisting equipment used in the transportation of persons and materials in shaft or slopes. All Federal and state statutes and rules applicable to the hoisting operations shall remain in force and shall be complied with.
  - 2) Hoists employed in transporting persons and material in any slope or shaft shall have rated capacities consistent with the loads to be handled and the recommended safety factors of the ropes used in such hoists. The rated capacity shall be posted within view of the hoist operator.
  - 3) The American National Standards Institute, "Specification for the Use of Wire Ropes for Mines," M11.1-1960, shall apply in the use, selection, installation, and maintenance of wire ropes. The following static load safety factors shall be used for selecting ropes to be used on hoists and for determining when such ropes shall be removed from hoists:

factor	Length of rope in shaft (feet)	Minimum factor of safety (new rope)	M i n i m u m of safety (remove)
	500 or less	8	6.4
	500 to 1,000	7	5.8
	1,000 to 2,000	6	5.0
	2,000 to 3,000	5	4.3
	3,001 or more	4	3.6

- 4) Each hoist employed 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, which shall be installed in clear view of the hoist operator.
- 5) Hoist drive units shall be protected from the weather, and the mechanism that operates the brakes shall be guarded to prevent material or tools from accidentally fouling or jamming the brake system.
- g) Communications between shaft and slope bottoms and hoist operations.
  - 1) There shall be at least two (2) effective methods of signaling approved by representatives of the Department of Natural Resources, Office of Mines and Minerals, one of which shall be audible to the hoistman at all times. The signaling system in use shall effectively notify all persons in all work

- areas of the shaft or slope being developed wherever any equipment is moving up or down the slope or shaft. Signal codes used shall be posted conspicuously at the entrance to the slope or shaft, in the working areas of each slope or shaft, and in clear view of the hoistman. Only those persons designated by the operator shall be authorized to operate the signal system in the slope or shaft and all persons in the slope or shaft shall be made aware of who is in charge of signaling the hoistman at all times.
- 2) Signaling systems used for communication between slopes and shafts and the hoistman shall be tested daily.
- h) Hoist safeguards; general.
- 1) 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. Such brakes shall be operated by the hoistman immediately prior to transporting persons. Conveyances shall not be lowered by the brakes alone, except in an emergency.
  - 2) When persons are transported by a hoist or by the hoisting operation a second person familiar with and qualified to stop the hoist shall be in direct and constant attendance, except where the hoist is fully equipped with overspeed, overwind, and automatic stop devices.
  - 3) Overwind devices shall be designed and installed to automatically stop the cage, bucket, or platform before it contacts the head sheave or other positive stopping obstacles under all conditions. Overwind devices shall be tested at the time of installation and prior to initial use by raising the cage, bucket, or platform at maximum speed until the overwind device is actuated.
- i) Hoists; inspection.
- 1) Hoists used to transport persons shall be inspected daily, and each such inspection shall include examination of the headgear (headframe, sheave wheels, etc.), ropes, connections, links and chains, signaling systems, and other facilities.
  - 2) Prior to each working shift and before a hoist is returned to service after it has been out of normal service for any reason, it shall be operated by the hoistman through one (1) complete cycle of operation before any persons or materials are permitted to be transported.
  - 3) The results of all inspections conducted in accordance with this section shall be recorded after each inspection in a book approved by the Department of Natural Resources, Office of Mines and Minerals, and shall be signed by a person making the inspection and shall be signed or countersigned daily by a certified shaft-slope supervisor required by this Section of this Act.
- j) Hoist construction; general.

- 1) Hoisting ropes shall be equipped with a spelter-filled socket, wedge socket, or thimble with an adequate number of clamps properly spaced and installed along the rope.
  - 2) Slope cars when used for transporting persons shall be provided with two (2) bridle chains or cables connected securely to the rope at least three (3) feet above the socket or at least three (3) feet above the last rope clip if a thimble is used and which shall be securely fastened to the slope car when transporting persons or material.
  - 3) Where hooks are used to attach cages or buckets to the socket or thimble of a hoisting rope, they shall be self-closing.
  - 4) Hoisting ropes shall contain at least three (3) full turns on the hoist drum when the rope is extended to its maximum working length. At least one (1) full turn of the hoist rope shall be placed around the drum shaft or around the spoke of a free drum and both shall be fastened securely by means of clamps.
  - 5) Platforms used for transporting persons shall be equipped with a leveling indicator on the work deck. The platform shall be maintained in a level position at all times except when moving the platform. Self-dumping cages, platforms, or other devices used for transporting persons shall have a locking device to prevent tilting when persons are transported.
  - 6) All suspended work decks in shafts shall be of such construction to prevent overturning in the event of failure of one (1) of the suspension cables.
- k) Hoist installations; use.
- 1) Where persons are transported by means of a hoist and the depth of the shaft exceeds fifty (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 rope attachment to the conveyance.
  - 2) Where persons are transported by means of a hoist and the depth of the shaft exceeds one hundred (100) feet, temporary shaft guides and guide attachments shall be installed to prevent the cage, platform, or bucket from swinging unless the State Mining Board approves other means which will provide no less than the same degree of protection to the miners.
  - 3) Except for purpose of examination, all guides and guide attachments installed in accordance with paragraph (k)(2) of this Section, shall be maintained to a depth of not less than seventy-five (75) feet from the working area where men are present.
  - 4) Where crossheads are used, the cage, platform, or bucket shall not be hung more than ten (10) feet below the crosshead.
  - 5) Where men are required to embark or disembark over or within a shaft, a loading platform shall be installed to insure safe footing.



- 6) During the development of each slope or shaft, either a ladder or independently powered auxiliary hoist shall be provided to permit persons to escape quickly in the event of an emergency. At all times where men are on the bottom there shall be a means of access from the shaft bottom to the work deck other than the hoist. A chain ladder for this purpose will be acceptable.
  - 7) No person shall be permitted to ride the rim of any bucket or on the top of a loaded bucket.
  - 8) The maximum number of persons permitted to ride the conveyance at one time shall be posted conspicuously at the point of entrance to the shaft or slope and on the conveyance.
  - 9) 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.
  - 10) The speed of buckets transporting persons shall not exceed five hundred (500) feet per minute and not more than two hundred (200) feet per minute when within one hundred (100) feet of any stop, and less if required by a representative of the Department.
  - 11) A notice of established speeds shall be posted in clear view of the hoistman.
  - 12) Conveyances being lowered in a shaft in which persons are working shall be stopped at least fifteen (15) feet above such persons and shall be lowered further only after the hoistman has received a signal that all persons who may be endangered by the conveyance are in the clear.
  - 13) 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.
  - 14) Measures shall be taken to prevent material from falling back into the shaft while buckets or other conveyances are being unloaded.
  - 15) Properly attached safety belts shall be worn by all persons required to work in or over any shaft where there is a drop of ten (10) or more feet, unless other acceptable means are provided to prevent such persons from falling into the shaft.
- l) Hoist operator; qualified hoistman.
    - 1) Hoists shall be under the control of and operated by a person possessing a certificate of competency as hoist operator issued in accordance with Article 7 of the Illinois Coal Mining Act of 1953 as amended when persons are being transported or are in a slope or shaft. On each shift where persons are employed below the surface, there shall be an additional person so certified present to operate the hoist in case of an emergency.

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- 2) While mines are under construction and a crane or other similar mechanical contrivance is used as a means of raising or lowering men, the operator of such is required to be certified as a hoisting engineer (crane).
  - 3) While mines are under construction, hoisting engineers shall not leave their station while persons are underground unless relieved by another hoisting engineer. Any malfunction in the hoist shall be communicated to all employees underground immediately.
- m) Explosives and blasting; use of permissible explosives.  
Only permissible explosives as defined in Article 20 of the Illinois Coal Mining Act of 1953 as amended shall be used in sinking shafts and slopes.
- n) Use of nonpermissible explosives; approved by the Department.  
When the Department has determined that the use of nonpermissible explosives 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 issue a permit setting forth the safeguards to be employed by the operator to protect the health and safety of any person exposed to such blasting.
- o) Uses of nonpermissible shot-firing device.  
A shot-firing device approved by the Department may be used providing all persons are removed to a safe location on the surface prior to the connection of the shooting cable to the blasting device.
- p) Explosives and blasting; general.
- 1) Light and power circuits shall be disconnected or removed from the blasting area before charging and blasting.
  - 2) 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 the provisions of Articles 20 and 28 of the Illinois Coal Mining Act of 1953 as amended, and all shots shall be fired from the surface.
  - 3) All persons shall be removed from the slope or shaft prior to blasting.
  - 4) 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.
  - 5) Where it is impracticable to prepare primers in the blasting area, only the number of primers needed for one (1) round of shots shall be prepared and remain on the surface in an isolated area under the control of a person qualified to perform such work, designated by the operator. The primers shall be carried into the shaft or slope in specially constructed, insulated, covered containers by such a qualified person designated by the operator.
  - 6) 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.

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- 7) The sides of the slope or shaft between the overhead platform and the bottom where persons are working shall be examined after each blast and loose material removed.
  - 8) Loose rock and other material shall be removed from timbers and platforms after each blast before persons are lowered to the shaft bottom.
  - 9) In cases where explosives are underground and drill holes are being charged, all work shall be suspended and all persons removed from the shaft or slope upon the approach and presence of an electrical storm and persons shall not return until such danger has passed.
- q) Ventilation of slopes and shafts.
- 1) All slopes and shafts shall be ventilated by mechanical ventilation equipment during development. Such equipment shall be examined before each shift. The quantity of air in the slope or shaft shall be measured each shift by a certified slope-shaft examiner, and the results of such examinations and measurements shall be recorded in a book approved by the Department and shall be signed by the person making the examinations and measurements, and countersigned daily by a certified shaft-slope supervisor.
  - 2) Ventilation fans shall be:
    - A) Installed on the surface;
    - B) Installed in noncombustible housing;
    - C) 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;
    - D) 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;
    - E) Offset not less than fifteen (15) feet from the shaft or slope; and
    - F) Equipped with air ducts which are noncombustible 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; and
      - ii) Ducts shall extend as close to the bottom as necessary to keep the face clear of dangerous and noxious gases. Face as used in this Section is where excavating is progressing or was last done.
  - 3) A qualified person, designated by the operator, shall be assigned to maintain each ventilating system.

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- 4) The fan shall be operated a sufficient amount of time to clear the air prior to entering the underground area of a shaft or slope by any person and shall be operated continuously when persons are below the surface. Any accidental stoppage or reduction in air flow shall be corrected immediately; development work below the surface shall be stopped, all persons not needed to make necessary corrections to the ventilation system shall be removed to the surface within fifteen (15) minutes of the time the fan stopped or there was a reduction in the air flow, and all persons shall not return to the shaft or slope until an examination has been made by a certified shaft-slope examiner and declared safe.
- r) Ladders and stairways.
    - 1) Substantial stairways or ladders shall be used during the construction of all shafts where no mechanical means are provided for persons to travel.
    - 2) Landings at intervals of not more than thirty (30) feet shall be installed.
    - 3) Shaft ladders shall project three (3) feet above the collar of the shaft, and shall be placed at least three (3) inches from the side of the shaft.
  - s) Electrical Equipment.
    - 1) Electric equipment employed below the collar of a slope or shaft shall be permissible and shall be maintained in a permissible condition in accordance with the provisions of the Illinois Coal Mining Act of 1953, as amended and these rules.
    - 2) The insulation of all electric conductors employed below the collar of any slope or shaft shall be of the flame-resistant type.
    - 3) Only permissible lamps, portable flood-lights, and lighting equipment approved by the U.S. Bureau of Mines under Part 19, Part 20 and Part 26 of Chapter 1 (Bureau of Mines Schedules 6D, 10C, and 29A) or those listed by Underwriter's Laboratories, Inc., for use in hazardous locations, shall be employed below the collar of any slope or shaft.
  - t) Storage and handling of combustible materials.
    - 1) Liquified and nonliquified compressed gas cylinders, oil, gasoline, and other petroleum products shall not be stored within one hundred (100) feet of any slope or shaft opening.
    - 2) Other combustible material and supplies shall not be stored within twenty-five (25) feet of any slope, shaft opening, or fan.
    - 3) Pyritic slates, bony coal, culm, or other material capable of spontaneous combustion shall not be used for fill or as surfacing material within one hundred (100) feet of any slope or shaft opening.
    - 4) 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.

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- 5) Oily rags, wastes, waste paper, and other combustible material disposed of within or in the vicinity of any slope or shaft opening shall be stored in closed, noncombustible containers until removed from the area.
- u) Welding, cutting, and soldering; fire protection.
- 1) One (1) portable fire extinguisher shall be provided where welding, cutting, or soldering with arc or flame is performed.
  - 2) 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.
  - 3) Before welding, cutting, or soldering is performed in any slope or shaft designed to penetrate into any coal bed below the surface, an examination for methane shall be made by a person qualified to conduct such examination with a device approved by the Department 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.
  - 4) Noncombustible barriers shall be installed below welding, cutting, or soldering operations in or over a shaft.
- v) Certificate of Competency; shaft-slope workers.
- 1) Effective on and after May 1, 1978, no person shall be employed or engaged underground at a shaft, slope, or underground construction operation without having first obtained a Certificate of Competency from the Miners' Examining Board as a Shaft-Slope Worker. A person seeking a Certificate of Competency as Shaft-Slope Worker must produce evidence satisfactory to the Miners' Examining Board that he has had at least six (6) months of experience working in shaft and slope construction; and within six (6) months after becoming eligible he shall appear before the Miners' Examining Board and pass an examination as to his knowledge in the handling and use of explosives, and shall have completed a course in first aid to the injured and in mine rescue methods and in shaft ventilation; except that any such certified shaft-slope worker may have up to three (3) persons working with him and under his direction as apprentices, for the purpose of learning the business of shaft, slope, and underground construction and becoming qualified to obtain Certificates of Competency.
  - 2) *The Miners' Examining Board shall hold an examination once in each calendar month, and at such other times and at such places as the Director of the Office of Mines and Minerals may designate. The Director of the Office of Mines and Minerals shall endeavor to schedule*

*examinations at places located most conveniently with reference to the Districts in which coal is mined in the State of Illinois so that all persons in such district or in this State, or who may wish to come into this State for the purpose of engaging in mining, may be examined as to their competency and qualifications. Public notice of the examination shall be given through the press or otherwise no less than 7 days in advance of such meeting, which notice shall fix the time and place at which any examination under this Act is to be held. (Ill. Rev. Stat. 1991, ch. 96 1/2, par. 806.)*

- 3) Each applicant for the certificate provided for in this Section shall receive his certificate upon satisfactorily passing the examination, without payment of fees, except that a fee of two dollars (\$2.00) shall be paid to the Department for additional copies of certificates.
- w) Certificate of Competency; shaft-slope examiners.  
Effective on and after May 1, 1978, no person shall be employed or engaged as a Shaft-Slope Examiner without having first obtained a Certificate of Competency as a Shaft-Slope Examiner from the Mining Board. Each applicant for a Certificate of Competency as a Shaft-Slope Examiner shall produce evidence satisfactory to the Mining Board that he is of good repute, temperate habits and that he has had at least two (2) years of shaft, slope or underground construction experience. He shall pass an examination as to his experience in underground construction generating dangerous gases, his practical and technological knowledge of the nature and properties of fire damp, the laws of ventilation, the structures and use of safety lamps, and the laws of this State relating to safeguards against fires from any source in underground construction. He shall also submit to the Mining Board satisfactory evidence that he has completed a course of training in first aid to the injured. Persons who hold undergraduate degrees in Civil or Mining Engineering from an accredited school, college, or university or, who have graduated from and hold degrees in a mining engineering program approved by the Mining Board are required to have one (1) year of underground experience in shaft, slope, and underground construction to qualify for the examination for a Certificate of Competency as a Shaft-Slope Examiner.
- x) Shaft-Slope Examiners; duties and responsibilities.  
The Mining Board may designate functions to be performed by certified shaft-slope examiners in addition to those already assigned to such examiners by these rules.
- y) Certificate of Competency; shaft-slope supervisor.  
Effective on and after May 1, 1978, it shall be unlawful for the operator of any shaft, slope, or underground construction operation to have in his service any person that directs the supervisory personnel each shift who does not hold a Certificate of Competency from the Mining Board as a Shaft-Slope Supervisor. Each applicant for a Certificate of Competency as a Shaft-Slope Supervisor shall

produce evidence satisfactory to the Mining Board, that he either has had at least three (3) years practical underground experience in shaft, slope, or underground construction, or that he holds an undergraduate degree from an accredited school, college, or university in Civil or Mining Engineering or that he has graduated from and holds a degree in mining engineering program approved by the Mining Board and has eighteen (18) months experience in shaft, slope, and underground construction; that he has satisfactorily completed a course in instruction in first aid to the injured prescribed by the Department; and that he is a man of good repute and temperate habits. He shall also pass such examinations as to his experience in shaft and slope sinking, underground construction, the management of men, his knowledge of shaft and slope construction, machinery and appliances, the properties of mine gases, the principles of ventilation, the legal duties and responsibilities of Shaft-Slope Supervisor, and has acquired a Certificate of Competency as a Shaft-Slope Examiner as prescribed by the rules.

- z) Shaft-Slope Supervisor; duties and responsibilities.

A Shaft-Slope Supervisor must be present in the shaft and slope work areas at all times when work is in progress. The Mining Board may designate functions to be performed by the Shaft-Slope Supervisor in addition to those already assigned to such supervisors by these rules.

- aa) Applicability of Certifications of Mine Managers, Mine Examiners, and Miners to Shaft and Slope Functions. Any person who holds a Certificate of Competency from the Mining Board as Mine Manager or Mine Examiner, or who holds a Certificate of Competency from the Miners' Examining Board as a Miner may be permitted to perform the functions of a Shaft-Slope Supervisor, Shaft-Slope Examiner, or Shaft-Slope Worker respectively, if such certificate holder is approved for such shaft-slope functions by the Department. Such certificate holders may perform such functions only until such time as the next examination for certification in the particular category is given.

- bb) Temporary Certificate of Competency as Shaft-Slope Examiner or Shaft-Slope Supervisor.

Upon request by the State Mine Inspector of the district, the Mining Board may issue a Temporary Certificate of Competency as Shaft-Slope Examiner or Shaft-Slope Supervisor to any person having the knowledge and time requirements set forth in subsection (w) and (y) above. This temporary certificate will be valid only until the first available examination or six months, whichever is shorter. The Mining Board may issue an extension of Temporary Certificates of Competency as a Shaft-Slope Supervisor only to those persons who take and pass the next Shaft-Slope Examiner examinations following the date of their original temporary certification.

- cc) Application of the Coal Mining Act of 1953 as amended.

All the provisions of the Illinois Coal Mining Act of 1953 as amended where applicable shall apply to shaft, slope, and underground construction.

- dd) Certificate of competency-hoisting engineer (crane).
- 1) In any mine under construction where a crane or other similar mechanical contrivance is used as a means of raising or lowering persons, for operation of which equipment an electrical hoisting engineer certificate is not required under Section 7.02 of the Act, the Mining Board may grant a certificate to operate such equipment to any person recommended to the Mining Board by the State Mine Inspector of the district. The applicant for such permit shall have filed with the Mining Board satisfactory evidence that the applicant has had at least one (1) year of experience in operating a crane or device of the type to be certified and understands the handling and care of the same. Such application shall be accompanied by statements under oath from at least three (3) persons who are mine managers, examiners, or miners certified by the Board, who affirm from their personal knowledge of the applicant that the applicant is a person of good repute and personal habits, and that the applicant has, from their observation and in the judgment, a good knowledge of an experience in handling devices of the type for which certification is sought.
  - 2) Such certificate shall apply only to the mine and device(s) for which it is issued, and shall be valid for a period not to exceed one (1) year, except such certificate may be renewed by the Mining Board from year to year if the person holding same requests renewal, and certifies by sworn statement, affirmed by the State Mine Inspector of the District, that the circumstances and conditions relating to the holder's competency are the same as when the certificate was originally issued, and that the person holding same has operated the equipment for which he or she was certified satisfactorily during the prior term of the certificate.
  - 3) Requests for renewal of certificates shall be submitted to the Board at least thirty (30) days in advance of expiration.
  - 4) It shall be a violation of this Section for any person to operate hoisting equipment described in paragraph (cc)(1) hereof, to raise or lower men in mines under construction without current, valid certificate of the Board. This Section does not apply to operations expressly exempt from certification under Section 7.03 or subject to Section 7.04 of the Act.
  - 5) A certificate issued hereunder is subject to revocation at any time if the holder fails to exercise due care or attention to duty or otherwise does not have the qualifications to hold the certificate. A certificate is subject to temporary suspension by a mine inspector if, in the judgement of mine inspector, such suspension is required or advisable to assure the health and safety of any person. In the event of such suspension, the holder is entitled to a prompt hearing by the Board. The Board may revoke a certificate after notice and hearing as provided by Board rules.



(Source: Amended at 16 Ill. Reg. 11463, effective July 6, 1992)

Section 220.200 Surface Bathing Facilities, Change Rooms and Sanitary Flush Toilet Facilities at Surface Coal Mines

- a) Bathing facilities; change rooms; sanitary flush toilet facilities.  
Each operator of a coal mine shall provide bathing facilities, clothing change rooms, and sanitary flush toilet facilities, as hereinafter prescribed, for the use of miners employed in the surface installations and at the surface worksites of such mine.
- b) Location of facilities.
  - 1) Bathhouses, change rooms, and sanitary flush toilet facilities shall be in a location convenient for the use of the miners.
  - 2) All bathhouses shall be constructed to provide at least ten (10) square feet of unobstructed floor space for each employee using the facility at any given time. In the computation of the area to be dedicated to employee floor space, the space taken up by obstructions such as lockers, and clothes baskets, and by common areas such as exit passageways and walkways shall not be included. In that same computation, the space taken up by benches or seats provided for the use of miners may be included. This Section shall apply to all bathhouses constructed or expanded after the effective date of this Section. This Section shall not apply to a bathhouse constructed or expanded after the effective date of this Section, if, and only if, valid contracts for such construction or expansion have been entered prior to the effective date. Evidence of such contracts shall be submitted to the Department prior to the beginning of such construction or expansion and no construction or expansion which fails to meet the requirements of this Section shall commence without the express approval of the Department.
  - 3) Where females are employed, separate facilities shall be provided. These facilities shall meet the requirements of this Section.
- c) Minimum requirements for bathing facilities, change rooms, and sanitary flush toilet facilities.
  - 1) All bathing facilities, change rooms, and sanitary flush toilet facilities shall be provided with adequate light, heat, and ventilation so as to maintain a comfortable air temperature and to minimize the accumulation of moisture and odors, and the facilities shall be maintained in a clean and sanitary condition for each oncoming shift.
  - 2) Bathing facilities, change rooms, and sanitary flush toilets facilities shall be constructed and equipped so as to comply with all applicable state and local building codes. However, where no state or local building and plumbing codes apply to these facilities, or where no state or local building and plumbing codes exist, the facilities shall be constructed and equipped

so as to meet the minimum construction requirements of the most recent National Building Code and the plumbing requirements of the most recent National Plumbing Code which documents are hereby incorporated by reference and made a part hereof.

- 3) In addition to the minimum requirements specified in paragraphs (c)(1) and (c)(2) of this Section, facilities maintained in accordance with Section 220.200(a) shall include the following:

A) Bathing facilities:

- i) Showers shall be provided with both hot and cold water. The Department shall take monthly samples to insure an adequate supply of safe, clean, hot and cold water satisfactory for shower and bathing purposes, except where a municipal water supply is used, and the record of the results of such sampling shall be retained by the Department;
- ii) At least one (1) showerhead shall be provided where five (5) or less miners use such showers;
- iii) Where five (5) or more miners use such showers at any particular time, sufficient showers shall be furnished to provide approximately one (1) showerhead for each such five (5) miners; and
- iv) A suitable nonirritating cleaning agent shall be provided for use at each shower.

B) Sanitary flush toilet facilities:

- i) At least one (1) sanitary flush toilet shall be provided where ten (10) or less miners use such toilet facilities;
- ii) Where ten (10) or more miners use such toilet facilities at any particular time sufficient flush toilets shall be furnished to provide approximately one (1) sanitary flush toilet for each such ten (10) miners;
- iii) Where thirty (30) or more miners use toilet facilities one (1) urinal may be substituted for one (1) flush toilet; however, where such substitutions are made they shall not reduce the number of toilets below a ratio of two (2) flush toilets to one (1) urinal;
- iv) An adequate supply of toilet paper shall be provided with each toilet;
- v) Hand lavatories shall be provided in or adjacent to each toilet facility; and
- vi) Toilets shall be separated by partitions.

C) Change rooms:

- i) Individual clothes storage containers or lockers shall be provided for storage of miners' clothing and other incidental personal belongings during and between shifts;
- ii) Change rooms shall be provided with ample space to permit the use of such facilities by all miners changing clothes prior to and after each shift; and
- iii) Two (2) separate means of exit shall be provided from each bathhouse.

#### Section 220.210 Sanitary Toilet Facilities at Surface Coal Mines

- a) Sanitary toilet facilities at surface worksites; approved sanitary toilets; installation requirements.
  - 1) Each operator of a surface coal mine shall provide and install at least one (1) approved sanitary toilet, together with an adequate supply of toilet tissue, in a location convenient to each surface work site. A single approved sanitary toilet may serve two (2) or more surface worksites in the same surface mine where the sanitary toilet is convenient to each such worksite. Where ten (10) or more miners use such toilet facilities, sufficient toilets shall be furnished to provide approximately one (1) sanitary toilet for each ten (10) miners who use such facility at any particular time.
  - 2) Sanitary toilets which are consistent with the requirements of the Code of Federal Regulations (CFR) for surface installations shall be acceptable to the state.
- b) Sanitary toilet facilities; maintenance.

Sanitary toilets provided in accordance with the provisions of paragraph (a) above be regularly maintained in a clean and sanitary condition. Holding tanks shall be serviced and cleaned when full and in no case less than once each week when in use, by draining or pumping or by removing them for cleaning and recharging. Transfer tanks and transfer equipment, if used, shall be equipped with suitable fittings to permit complete draining without spillage and allow for the sanitary transportation of wastes. Waste shall be disposed of in accordance with all applicable state and local statutes and rules.

#### Section 220.220 Drinking Water

- a) Drinking water; general.

An adequate supply of potable water shall be provided for drinking purposes in each surface installation, and at each surface worksite of the mine.
- b) Drinking water; quality.
  - 1) Potable water provided in accordance with the provisions of Section 220.220(a) shall meet all the applicable minimum health requirements for

- drinking water established by the State of Illinois and the local government in which the mine is located.
- 2) The Department shall take spot samples of the drinking water from different locations in the mine each month to insure potability.
- c) Drinking water; distribution.
- 1) Water shall be piped or transported in sanitary containers. Water systems and appurtenances thereto shall be constructed and maintained in accordance with all applicable State of Illinois and local government requirements. Where no such requirements are applicable, water systems and appurtenances shall be constructed and maintained in accordance with all the applicable requirements of the most recent National Plumbing Code, which is hereby incorporated by reference and made a part hereof.
  - 2) Water transported to the site shall be carried, stored and otherwise protected in sanitary containers constructed of smooth, impervious, heavy gauge, corrosion resistant materials. The containers shall be marked with the words "Drinking Water".
- d) Drinking water; dispensing requirements.
- 1) Water shall be dispensed through a drinking fountain or from a water storage container with an adequate supply of single service cups stored in a clean sanitary manner. Water shall not be dipped from inside water storage containers. Use of a common drinking cup is prohibited.
  - 2) Water containers shall remain sealed at all times during use and shall not be refilled with water for reuse without first being cleaned and disinfected with the use of heat or sanitizers.
  - 3) Drinking fountains from which water is dispensed shall be thoroughly cleaned once (1) each week, and maintained at all times in a clean and sanitary manner.
  - 4) Ice used for cooling drinking water shall not be immersed or in direct contact with water to be cooled, unless it has been handled in a sanitary manner and unless the ice is made from the same source as the drinking water or from water of a quality equal to the source of the drinking water.

#### Section 220.230 Health and Safety Rules Applicable to Underground Coal Mines

This Section sets forth mandatory health and safety standards applicable to underground coal mines. This Section complements the specific provisions of the Coal Mining Act of 1953, as amended, and in no way limit or diminish the applicability of that law to underground coal mines. In adopting this Section, the Mining Board and the Director have adhered to the statutory standards affecting the adoption of and promulgation of health and safety rules, including, but not limited to, Section 2.12 of the Coal Mining Act of 1953 (Ill. Rev. Stat. 1981, ch. 96 1/2, par.

312), as amended, and the Rules of Procedure in Administrative Proceedings (62 Ill. Adm. Code 100) in the Department of Natural Resources (Department) before the Mining Board.

- a) Submission of plan where coal is broken down by compressed air.  
In each mine where coal is "broken down" by compressed air, a plan describing the means by which coal is to be "broken down" shall be submitted to the Mining Board for the Board's retention and file. Nothing in this Section shall be construed to require approval of such plan by the Mining Board.
- b) Submission of fan stoppage plan.  
Each operator of an underground mine shall submit the fan stoppage plan required by the Mine Safety and Health Administration to the Mining Board for the Board's retention and file. Nothing in this Section shall be construed to require approval of such plan by the Mining Board.
- c) Hoisting of persons; stationing of competent persons.  
At every shaft and/or slope where persons are hoisted or lowered, the operator shall station a competent person at the top and at the bottom of such shaft and/or slope who shall attend to signals, and be empowered to preserve order and enforce the rules governing the carriage of persons on means of conveyance. The top person and bottom person shall be at their respective posts of duty a sufficient length of time before the shift begins in the morning and after the shift ends for the day to properly perform their duties as provided for in this Section. Cagers and alternates should be trained or instructed as to duties and signals. No operator shall use persons not familiar with caging procedures.
- d) Uniform daily inspection of hoists.  
Procedures shall be adopted for the uniform daily inspection of all electric hoists, cages, guides, and other equipment associated with the hoisting and lowering of men.
- e) Communications between coal-producing sections and the surface.  
A means of communication from each coal-producing section to the surface shall be maintained at all times while coal is being mined. No coal shall be produced nor shall any face equipment be operated on such section while there is an interruption in that communication. An interruption in the communication from one (1) coal-producing section to the surface shall not prohibit the production of coal on any other coal-producing section or area of the mine. Nothing in this Section shall preclude work other than the production of coal during the time that the communication system is interrupted.
- f) State mine inspectors; notification of miners' representative prior to inspection and posting of findings and recommendations.  
On each visit to the mine, the State Mine Inspector shall notify a representative of the miners that he is there to make an inspection so that the miners' representatives may accompany him if they so desire. Following each inspection, the inspector shall meet with management and representatives of the miners at the request of either or both of them to discuss his findings and recommendations.

His findings and recommendations together with the time provided to comply shall be posted in a conspicuous place following each inspection. The length of time to comply will be based upon the nature and severity of the infraction(s) noted.

- g) Standards for Diesel Engines in Underground Coal Mines.  
The following rules govern the operation of diesel equipment in underground coal mines. In addition to these rules, compliance with 30 CFR 31, 32, and 36 (1983) as pertaining to the operation and maintenance of diesel equipment is required.
- 1)
  - A) Before operating any diesel equipment in an underground mine, the operator must submit to the Department of Natural Resources a mining plan amendment which shall contain a ventilation plan stating the quantity of air in the areas where the diesel equipment will be operating and the number of diesel units which the mine operator plans to operate. An operator must meet also the quantity of air requirements of Section 31.02 of the Coal Mining Act of 1953. This plan must also contain the projected quantities of diesel fuel to be used in a 24-hour period. The State Mine Inspector shall adjust the quantity of diesel fuel allowed in the mine in accordance with Sections (11) and (12) herein by submitting such adjustment in writing to the Department.
  - B) No diesel equipment shall be placed in initial operation underground until it is checked for approval in accordance with Sections (2) and (10) herein and tested in accordance with Sections (3) and (4) herein by the State Mine Inspector for the district in which the mine is located. The State Mine Inspector shall submit to the Department, in writing, the mine operator's name, type of equipment, serial number and Mine Safety and Health Administration (MSHA) certification number.
  - C)
    - i) To amend a mining plan to include the use of diesel equipment in underground coal mines, an operator must submit a request for a mining plan amendment to the Mining Board. Upon receipt of that request, the State Mine Inspector shall test the mine in which the equipment is proposed to be used to insure that sufficient ventilation exists to comply with this rule.
    - ii) The State Mine Inspector shall test the diesel equipment which is proposed to be used in the mine prior to its installation for compliance with this rule. If this equipment meets the requirements of this rule, it shall be installed in the mine in which it is to be operated and tested again by the State Mine Inspector to insure it complies with the requirements of this rule. This equipment may not be operated until such time as its use is approved by the Mining Board.

- iii) The State Mine Inspector shall provide a written report of the results of the testing of the equipment to the Mining Board. Within 10 days of receipt of the State Mine Inspector's report, the Mining Board shall approve or disapprove the operator's request. Within 10 days of such action, the Mining Board shall notify the operator of its decision. A denial of the operator's request shall be accompanied by a statement of reasons for the denial.
- 2) All diesel equipment operated in by the last open crosscut and in return air courses shall be permissible and shall be maintained and operated in a permissible condition as defined by 30 CFR 31 and 36 (1983). "Permissible", as used herein, shall mean diesel equipment which will not cause an underground ignition if an explosive mixture of gas is present and this piece of diesel equipment is operated in the presence of this explosive mixture of gas.
- 3) The quantity of ventilating air maintained in the last open crosscut where multiple diesel units are operating in a working section shall be at least 100 percent of the air quantity specified on the approval plate of the first diesel unit (the unit requiring the highest air quantity on its approval plate), plus 75 percent of the approved plate air quantity of the second diesel unit (next highest air quantity), plus 50 percent of the approval plate air quantity of each additional diesel unit operating in that split of air.
- 4) Air quality in which diesel equipment is operated shall be sampled to determine if the composition of the air is within safe limits with respect to CO, NO, and NO. These safe limits are currently defined as being equal to or less than the following values:

	TLV-TWA
Carbon Monoxide (CO)	50 ppm
Nitrogen Dioxide (NO)	3 ppm
Nitric Oxide (NO)	35 ppm

(Reference: 30 CFR 75.301-2 MSHA and Threshold Limit Values for Chemical Substances in Work Air adopted by American Conference of Government and Industrial Hygienists, 1982)

- 5) Air quality measurements for face equipment shall be taken in the operator compartment of the diesel equipment at a point where the air current exists the last open crosscut. Measurements must comply with Section (4) above.
- 6) Air quality measurements shall also be taken in the immediate return from each working section, while all units of diesel equipment being employed in that Section during the shift are operating. Measurements must comply with Section (4) above.

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- 7) The measurements required in Sections (5) and (6) shall be made no less than twice a shift in mines and working sections employing diesel engines for the first time. After 500 hours of operating time has been accumulated in compliance with Sections (5), (6) and (7), the measurement frequency shall be reduced to once a week for the air quality measurements in the operator's compartment (Section (5)) and once per shift for air quality measurements in the immediate returns (Section (6)).
  - 8)
    - A) Air quality measurements shall be taken by one of the following recognized methods:
      - i) gas concentration indicator tubes;
      - ii) vacuum bottle sample and subsequent analysis; or
      - iii) direct readout instruments which the Mine Safety and Health Administration has certified under 30 CFR 75.303-1, 75.303-2 (1985).
    - B) These testers shall be provided and maintained by the mine operators.
  - 9) All tests shall be made by a competent person and the results of these tests shall be permanently recorded and kept in a place at the mine accessible to federal or state mine inspectors or officials, mine employees, or mine employee's representatives. These records shall be made available for inspection during the hours the mine's offices are open to the public. "Competent person" as used herein and in Section (14) below, shall mean a person trained by an instructor certified by MSHA under 30 CFR 48.3(h) (1985) or the Department to provide such training.
  - 10) Air quality for outby diesel equipment shall meet the standards provided in 30 CFR 32 (1983) as that section pertains to mobile powered diesel equipment.
  - 11) Diesel fuel storage and handling in a working section shall comply with the following:
    - A) Only one diesel fuel center will be allowed to be in permanent residence.
    - B) The diesel fuel center may be stored in combination with and/or in the same area as hydraulic oil, lubricating oil greases.
    - C) At least two approved ABC fire extinguishers will be available at the storage area.
    - D) The storage area shall be vented directly to the returns.
    - E) Storage shall be limited to a typical 24-hour supply for a given working section or not to exceed 500 gallons.
  - 12) Diesel fuel storage for the mine shall comply with the following:
    - A) The underground storage area shall be vented directly to the returns.



- B) At least two 150 lb. approved ABC type fire extinguishers and no less than 200 lbs. of rock dust shall be available at the underground mine storage area.
  - C) Storage underground shall be limited to a typical 24-hour supply for all normally operating diesel units in the mine.
- 13) All diesel engines, in particular, their intake and exhaust systems, shall be maintained in accordance with the manufacturers specifications and instructions and in accordance with 30 CFR 31.4-31.5 (1985). Maintenance manuals shall be made available by the operator to the inspectors when requested.
  - 14) Maintenance and inspection of diesel equipment will be conducted only by competent persons authorized by the mine operator (not to include State Mine Inspectors).
  - 15) An approved ABC type fire extinguisher shall be carried at all times on each unit of diesel powered equipment.
  - 16) No gasoline powered device will be allowed in an underground coal mine.

(Source: Amended at 10 Ill. Reg. 8104, effective June 15, 1986)