
**Rules of
Department of Labor and Industrial
Relations**

**Division 30—Division of Labor Standards
Chapter 2—Mining Rules**

| Title | Page |
|--|-------------|
| 8 CSR 30-2.010 Definitions | 3 |
| 8 CSR 30-2.020 Standard Practices for Safety and Operation..... | 4 |



**Title 8—DEPARTMENT OF
LABOR AND
INDUSTRIAL RELATIONS**

**Division 30—Division of
Labor Standards
Chapter 2—Mining Rules**

8 CSR 30-2.010 Definitions

PURPOSE: This rule defines those terms used by the inspection section, Division of Labor Standards in the rules establishing standards for safe practices in the mining industry.

- (1) Active workings means any place in any mine where miners are normally required to work or travel.
- (2) ANFO means ammonium nitrate-fuel oil mixtures.
- (3) Approved means tested and accepted for a specific purpose by a nationally recognized safety agency.
- (4) Barricaded means obstructed to restrict the passage of persons, vehicles or flying materials.
- (5) Berm means a pile or mound of material capable of restraining a vehicle; also a shelf, ledge or material placed to contain loose slope material.
- (6) Blasting agent means a cap insensitive chemical composition or mixture consisting of fuel and oxidizer and no explosive ingredient but which can be made to detonate when initiated with a high strength explosive primer.
- (7) Blasting area means the area near blasting operations in which concussion or flying material can reasonably be expected to cause injury.
- (8) Blasting cap means a detonator containing a charge of detonating compound, which is ignited by electric current or the spark of a fuse; used for detonating explosives.
- (9) Blasting circuit means electric circuits used to fire electric detonators or to ignite an igniter cord by means of an electric starter.
- (10) Blasting switch means a switch used to connect a power source to a blasting circuit.
- (11) 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.
- (12) Capped fuse means a length of safety fuse to which a detonator has been attached.
- (13) Capped primer means a package or cartridge of explosives which is specifically designed to transmit detonation to other explosives and which contains a detonator.
- (14) Combustible means capable of being ignited and consumed by fire.
- (15) Director means director of the Division of Labor Standards.
- (16) Company official means a member of the company supervisory or technical staff.
- (17) Competent person means a person having abilities that fully qualify him/her to perform the duty to which s/he is assigned.
- (18) Department means Department of Labor and Industrial Relations.
- (19) Detonating cord or detonating fuse means a flexible cord containing a core of high explosive.
- (20) 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.
- (21) Distribution box means a portable apparatus with an enclosure through which an electric circuit is carried to one (1) or more cables from a single incoming feedline; each cable circuit being connected through individual overcurrent protective devices.
- (22) Electric blasting cap means a blasting cap designed for and capable of being ignited by means of an electric current.
- (23) Electric grounding means to connect with the ground to make the earth part of the circuit.
- (24) Employee means a person who works for wages or salary in the service of an employer.
- (25) Employer means a person or organization employing one (1) or more persons to work for wages or salary.
- (26) Explosives 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 and ammonium nitrate when mixed with a hydrocarbon plus high explosive ingredients.
- (27) Face-to-wall means that part of any mine where excavating is progressing or was last done.
- (28) Flammable means capable of being easily ignited and of burning rapidly as defined by the National Fire Protection Association.
- (29) Highway means any public road or travelway used by the general public.
- (30) Igniter cord means a fuse, cordlike in appearance, which burns progressively along its length with an external flame at the zone of burning and is used for lighting a series of safety fuses in the desired sequence.
- (31) Inhabited building means a building regularly occupied in whole or in part as a habitation for human beings or any church, schoolhouse, railroad station, store, factory or other structure where people are accustomed to assemble except any building or structure occupied in connection with the manufacture, transportation, storage or use of explosives.
- (32) Low voltage means electric potential up to and including 660 volts, medium voltage means voltages from 661 to 1000 volts and high voltage means more than 1000 volts.
- (33) Magazine means a storage place for explosives or detonators.
- (34) Major electrical installation means an assemblage of stationary electrical equipment for the generation, transmission, distribution or conversion of electric power.
- (35) Misfire means the complete or partial failure of a blasting charge to explode as planned.
- (36) Overburden means material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials or ores that are to be mined.
- (37) 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.



(38) Reverse-current protection means a method or device used on direct current circuit equipment to prevent the flow of current in the reverse direction.

(39) Roll protection means a framework or safety canopy to protect the vehicle operator if equipment should overturn.

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

(41) Safety fuse means a train of powder enclosed in cotton, jute yarn and water-proofing compounds which burn at a uniform rate; used for firing a cap containing the detonating compound which in turn sets off the explosive charge.

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

(43) Scaling means removal of insecure material from a face or highwall.

(44) Secondary safety connection means a second connection between a conveyance and rope, intended to prevent the conveyance from running away or falling in the event the primary connection fails.

(45) Semiconductive hose means hose having an electrical resistance of not less than five thousand (5000) ohms per foot and not more than two (2) megohms for its total length, used in pneumatic placement of blasting agents in boreholes.

(46) Sprung hole means a blasting hole chambered or enlarged to take an increased charge of explosives.

(47) Stemming means the inert material and the placing of such material, on top of any charge of explosives.

(48) Stray current means that portion of a total electric current that flows through paths other than the intended circuit.

(49) Substantial construction means construction of such strength, material and workmanship that the object will withstand all reasonable shock, wear, usage and deterioration to which it will normally be subjected.

(50) Suitable means that which fits and has the qualities or qualifications to normally

meet a given purpose, occasion, condition or function or circumstance.

(51) Travelway means a passage, walk or way regularly used and designated for persons to go from one place to another while at work.

(52) Wet drilling means the continuous application of water to the back or bottom of the drill holes while drilling.

(53) Working place means any place in or about a mine where work is being performed.

AUTHORITY: sections 286.060 and 293.630, RSMo 1986. Original rule filed Dec. 18, 1975, effective Dec. 28, 1975.*

**Original authority: 286.060, RSMo 1945, amended 1947, 1980 and 293.630, RSMo 1959.*

8 CSR 30-2.020 Standard Practices for Safety and Operation

PURPOSE: This rule sets forth the specific safety and operating standards for the mining industry relative to specific areas of operation including ground control, fire prevention and control, explosives, drilling for blasting, loading, hauling, dumping, travelways, electricity, use of equipment, personal protection and general.

PUBLISHER'S NOTE: The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. Therefore, the material which is so incorporated is on file with the agency who filed this rule, and with the Office of the Secretary of State. Any interested person may view this material at either agency's headquarters or the same will be made available at the Office of the Secretary of State at a cost not to exceed actual cost of copy reproduction. The entire text of the rule is printed here. This note refers only to the incorporated by reference material.

(1) Practices and standards acceptable to the director for the safe control of surface mine walls, including the overall slope of the mine wall, shall be established and followed by the operator. Such standards shall be consistent with sound engineering, the nature of the ground and the mine seams and the insuring of safe working conditions according to the degree of slope. Mining methods shall be selected which will provide wall stability, including benching, if necessary, to obtain a safe overall slope.

(2) All loose and hazardous material shall be stripped for a safe distance from the edge of the highwall.

(3) The width and height of benches shall be governed by the type of equipment to be used and the operation to be performed.

(4) Safe means of scaling walls shall be provided. Loose material or trees on exposed wall areas shall be removed before any other work is performed in the exposed wall area.

(5) Men shall not work under dangerous walls. Hazardous overhanging walls shall be taken down immediately and other unsafe ground conditions shall be corrected promptly or the areas shall be barricaded or posted.

(6) When removing rock by hand, men shall approach loose rock and areas on walls to be scaled from above and shall scale from a safe location.

(7) The supervisor or a competent person designated by him/her shall examine working areas and faces of walls for unsafe conditions at least at the beginning of each shift, during the shift while men are working and after blasting. Any unsafe conditions found shall be corrected before any further work is performed at the immediate area or face at which the unsafe condition exists.

(8) Men shall examine their working places before starting work and frequently thereafter and any unsafe conditions shall be reported immediately to the supervisor before any other work is performed.

(9) Large boulders requiring secondary blasting shall be in a safe location before they are drilled or broken.

(10) Men shall not be permitted to work between equipment and the mine wall where the equipment may hinder escape from falls or slides of the wall, unless special safety precautions are taken in advance.

(11) No person shall smoke or use an open flame where flammable or combustible liquids or greases are stored or in areas or places where fire or explosion hazards exist.

(12) Signs warning against smoking and open flames shall be posted so they can readily be seen in areas or places where fire or explosion hazards exist.

(13) Areas surrounding flammable-liquid storage tanks and electric substations and



transformers shall be kept free from grass (dry), weeds, underbrush and other combustible materials for at least twenty-five feet (25') in all directions.

(14) 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.

(15) 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.

(16) Abandoned electrical circuits shall be de-energized and isolated so that they cannot become energized inadvertently. If no further use is intended, they shall be removed.

(17) Combustible materials, grease, lubricants or flammable liquids shall not be allowed to accumulate where they can create a fire hazard.

(18) 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.

(19) When flammable solvents are used for cleaning, such solvents shall be transported in safety cans of not over five (5)-gallon capacity. When solvents are 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.

(20) Oxygen cylinders shall not be stored near oil or grease.

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

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

(23) Battery-charging stations shall be located in well ventilated areas and in the clear of other equipment.

(24) Internal combustion engines, except diesels, shall be shut off and stopped before being fueled.

(25) Each mine shall have available or be provided with, appropriate types of firefighting equipment adequate for the size of the mine.

(26) Firefighting equipment shall be strategically located, readily accessible, plainly marked, properly maintained and inspected periodically and records shall be kept of such inspections.

(27) Fire extinguishers shall be adequate in number and size and of the appropriate type for each particular fire hazard involved.

(28) Fire extinguishers shall be replaced immediately with fully charged extinguishers of the same capability after any discharge is made from the extinguishers.

(29) Fire extinguishers shall be inspected at least every six (6) months, tested at least once each year and maintained according to the manufacturer's recommendation. Each extinguisher shall bear a tag showing the date of inspection and testing and the initials or name of the person making the examination.

(30) Fire extinguishers shall be approved by Underwriters' Laboratories, Inc. or Factory Mutual Research Corporation.

(31) When welding or cutting near combustible materials, precautions shall be taken to insure that smoldering metal or sparks do not result in fire.

(32) Belt conveyors in locations where fire would create a hazard to personnel shall be provided with safety switches to stop the drive pulley automatically in the event the belt stalls or there is excessive slippage.

(33) Detonators and other cap sensitive high explosives shall be stored in magazines provided for that purpose.

(34) Blasting agents may be stored in van-type trailers, provided that they are well ventilated, kept clean and free of extraneous material that could create a fire hazard.

(35) Blasting agents, safety fuse or detonating cord may be stored with explosives, but blasting agents must be kept physically separated from the fuse, detonators and explosives.

(36) Magazines shall be—

(A) Detached structures located away from power lines, fuel storage areas and other possible sources of fire;

(B) Constructed substantially of noncombustible material or covered with fire-resistant material;

(C) Electrically bonded and grounded if constructed of metal;

(D) Made of nonsparking materials on the inside including floors;

(E) Provided with adequate and effectively screened ventilation openings near the floor and ceiling;

(F) Kept locked securely when unattended;

(G) Used exclusively for storage of blasting agents, explosives or detonators and kept free of all extraneous materials;

(H) Kept clean and dry in the interior and in good repair; and

(I) Unheated, unless heated in a manner that does not create a fire or explosion hazard. Electrical heating devices shall not be used inside a magazine.

(37) Only permissible lights worn or carried shall be used inside magazines.

(38) Area surrounding magazines not less than twenty-five feet (25') in all directions shall be kept free of rubbish and other combustibles.

(39) Smoking and open flames shall not be permitted within twenty-five feet (25') of explosives and detonator-storage magazines.

(40) Cases of explosives shall be stored in such a manner to assure the use of the oldest stock first.

(41) Ammonium nitrate-fuel oil (ANFO) mixtures shall be physically separated from dynamite stored in the same magazine and in such a manner that oil does not contaminate the dynamite.

(42) Cases of explosives shall not be stored on their ends or sides nor in stacks over six feet (6') high.

(43) Explosives and detonators shall be transported in separate vehicles unless separated by four inches (4") of hardwood or the equivalent.

(44) Self-propelled vehicles used to transport explosives or detonators shall be equipped with suitable fire extinguishers and marked with proper warning signs.

(45) When vehicles containing explosives or detonators are parked, the brakes shall be set, the motor power shut off when not in use, and the vehicle shall be blocked securely against rolling when parked on an incline.

- (46) Vehicles containing explosives or detonators shall not be left unattended except in blasting areas where loading or charging is in progress.
- (47) Vehicles containing explosives or detonators shall not be taken to a repair garage or shop for any purpose.
- (48) Vehicles used to transport explosives or detonators shall be maintained in good condition and shall be operated at a safe speed and in accordance with recognized safe operating practices.
- (49) Vehicles used to transport explosives other than ANFO mixtures, 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 enclosures.
- (50) Explosives shall be transported at times and over routes that expose a minimum number of persons.
- (51) Other materials or supplies shall not be placed on or in the cargo space of a conveyance containing explosives or detonators.
- (52) No person shall smoke while transporting or handling explosives or detonators.
- (53) Only the necessary attendants shall ride on or in vehicles containing explosives or detonators.
- (54) Explosives shall be transported promptly without undue delays in transit.
- (55) Nonconductive containers with tight-fitting covers shall be used to transport or carry capped fuses and electric detonators to blasting sites.
- (56) Substantial nonconductive closed containers shall be used to carry explosives to blasting sites.
- (57) Persons who use explosives, blasting agents or detonators shall be competent and understand the hazards involved; trainees shall do such work only under the supervision of and in the immediate presence of competent men.
- (58) Blasting operations shall be under the direct control of competent persons designated by the operator for that purpose.
- (59) Damaged or deteriorated explosives, blasting agents and detonators shall be disposed of in a safe manner and as soon as possible.
- (60) Explosives or detonators shall not be taken to the face or the immediate vicinity (within twenty-five feet (25')) of the blasting site until all other work has been completed.
- (61) Holes to be blasted shall be charged as near to blasting time as practical and such holes shall be blasted as soon as practicable after charging has been completed.
- (62) No person shall smoke within twenty-five feet (25') of explosives, blasting agents or detonators.
- (63) Explosives and blasting agents shall be kept separated from detonators until charging of holes is started.
- (64) Primers shall be made up at the time of charging and as close to the blasting site as conditions allow.
- (65) Only wooden or other nonsparking devices shall be used to punch holes in explosives cartridges.
- (66) Tamping poles shall be blunt and squared at one (1) end and made of wood or other nonsparking material.
- (67) No tamping shall be done directly on primer cartridges.
- (68) Unused explosives and detonators shall be moved back to magazine as soon as charging operations are completed.
- (69) Approaches to areas in which charged holes are awaiting firing shall be guarded, or barricaded and posted, or flagged against unauthorized entry. If blasting is done after dark, red flashing lights shall be used at the approaches to the blasting area.
- (70) When a blast is about to be fired, ample warning shall be given to allow all persons to retreat to a safe place. Each mine shall have a definite plan of warning signals that can be clearly seen or heard by anyone in the blasting area. The operator shall inform all employees at the local mine as to the established procedure.
- (71) When safety fuse has been used, men shall not return to misfired holes for at least thirty (30) minutes.
- (72) When electric blasting caps have been used, men shall not return to misfired holes for at least fifteen (15) minutes.
- (73) Blasted materials shall be examined for undetonated explosives after each blast and undetonated explosives found shall be disposed of safely.
- (74) Misfires shall be reported to the proper supervisor and shall be disposed of safely before any other work is performed in the blasting area.
- (75) 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.
- (76) If explosives are suspected of burning in a hole, all persons in the endangered area shall move to a safe location until the danger has passed.
- (77) Holes shall not be drilled where there is danger of intersecting a charge or misfired hole.
- (78) Fuse and igniters shall be stored in a cool, dry place away from oils or grease.
- (79) Fuse shall not be kinked, bent sharply or handled roughly.
- (80) Fuses shall be cut and capped in safe, dry locations posted with No Smoking signs.
- (81) Blasting caps shall be crimped to fuses only with devices designed for that specific purpose.
- (82) Fuses less than forty-eight inches (48") long shall not be used for any purpose.
- (83) At least two (2) men shall be present when lighting fuses and no man shall light more than fifteen (15) individual fuses. If more than fifteen (15) holes per man are to be fired, igniter cord and connectors or electric blasting shall be used.
- (84) A safe interval of time shall be allowed to light a round and evacuate the blasting area.
- (85) Fuse shall be ignited with hot-wire lighters, lead spitters, igniter cord or other such devices designed for this purpose.
- (86) Fuse shall not be ignited before the primer and the entire charge are securely in place.
- (87) Electric detonators of different brands shall not be used in the same round.



- (88) Electric detonators shall remain shunted until they are being wired into the blasting circuit. Lead lines and wired rounds shall be kept shunted until immediately before blasting.
- (89) Completely wired round shall be tested with a blasting galvanometer before connections are made to the blasting line.
- (90) Lead wires and blasting lines shall not be strung across power conductors, pipelines or within twenty feet (20') of bare powerlines. They shall be protected from sources of static or other electrical contact.
- (91) Permanent blasting lines shall be properly supported, insulated and kept in good repair.
- (92) Charging shall be stopped immediately when the presence of static electricity or stray current is detected; the condition shall be corrected before charging is resumed.
- (93) Charging of holes shall be suspended and the men withdrawn to a safe location upon the approach of an electrical storm.
- (94) Safety switches and blasting switches shall be labeled, encased in boxes and arranged so that the covers of the boxes cannot be closed with the switches in closed position.
- (95) Blasting switches shall be locked in the open position, except when closed to fire the blast. Lead wires shall not be connected to the blasting switch until the shot is ready to be fired.
- (96) The key to a blasting switch shall be entrusted only to the person designated to fire blast.
- (97) Electrical circuits from the blasting switches to the blast area shall not be grounded.
- (98) At least a five foot (5') air gap shall be provided between the blasting circuit and the power circuit.
- (99) Where electric blasting is to be performed, electric circuits to equipment within twenty-five feet (25') of a hole that is to be charged with an electric blasting cap shall be de-energized before electric detonators are brought into the immediate area or the electric equipment shall be moved out of the immediate area.
- (100) Power sources shall be suitable for the number of electric detonators to be fired and for the type of circuits used.
- (101) When instantaneous blasting is performed, the double-trunkline or loop system shall be used in detonating cord blasting.
- (102) When instantaneous blasting is performed, trunklines in multiple-row blasting, shall make one (1) or more complete loops, with crossties between loops at intervals of not over two hundred feet (200').
- (103) All detonating-cord knots shall be tight and all connections shall be kept at right angles to the trunklines.
- (104) Delay connectors for firing detonating cord shall be treated and handled with the same safety precautions as blasting caps and electric detonators.
- (105) Detonating cord shall not be kinked, bent or otherwise handled in such a manner that the train of detonation may be interrupted.
- (106) Sensitized Ammonium Nitrate Blasting Agents.
(A) When used, the same precautions shall be taken as for high explosives.
(B) Adequate priming shall be employed to guard against misfires, increased toxic fumes and poor performance.
(C) Where pneumatic loading is employed, before any type of blasting operations using blasting agents is put into effect, an evaluation of the potential hazard of static electricity shall be made. Adequate steps, including the grounding of the conductive parts of pneumatic loading equipment, shall be taken to eliminate the hazard of static electricity before blasting agent preparation is commenced.
(D) Pneumatic loading equipment shall not be grounded to waterlines, airlines, rails or other permanent electrical grounding systems.
(E) Hoses used in connection with pneumatic loading machines shall be of the semi-conductive type, having 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. Wire-countered hose shall not be used because of the potential hazard from stray electric currents.
(F) Plastic tubes shall not be used to protect pneumatically loaded blasting agent charges against water unless a positive grounding system is provided to drain electrostatic charges from the holes.
- (107) Equipment for drilling and blasting shall be inspected each shift by a competent person designated by the operator. Equipment defects affecting safety shall be reported immediately.
- (108) Equipment defects affecting safety shall be corrected before the equipment is used.
- (109) The drilling area shall be inspected by a competent person designated by the operator for hazards before drilling operations are started.
- (110) Men shall not be on the mast while the drill is in operation.
- (111) 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.
- (112) Receptacles or racks shall be provided for drill steel stored on drills.
- (113) Tools and other objects shall not be left loose on the mast or drill platform.
- (114) When 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.
- (115) In the event of power failure, drill controls shall be placed in the neutral position until power is restored.
- (116) While in operation, drills shall be attended at all times.
- (117) Drill holes large enough to constitute a hazard shall be covered or guarded.
- (118) Men shall not drill from positions that hinder their access to the control levers, or from insecure footing or staging or from atop equipment not designed for this purpose.
- (119) Bit wrenches or bit knockers shall be used to remove detachable bits from drill steel.
- (120) Starter steels shall be used when collaring holes with handheld or feedleg drills.
- (121) Men shall not hold the drill steel while collaring holes or rest their hands on the chuck or centralizer while drilling.



(122) Air shall be turned off and bled from the hose before handheld drills are moved from one working area to another.

(123) Equipment used for loading, hauling and dumping shall be inspected each shift by a competent person designated by the operator. Equipment defects affecting safety shall be reported immediately.

(124) Equipment defects affecting safety shall be corrected before the equipment is used.

(125) Powered mobile equipment shall be provided with adequate brakes.

(126) Equipment operators shall be certain, by signal or other means, that all persons are in the clear before starting or moving equipment.

(127) 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 warning system shall be installed and operated to warn persons that the conveyor will be started.

(128) Trucks, shuttle cars and front-end loaders shall be equipped with emergency brakes separate and independent of the regular braking system.

(129) Operators' cabs shall be constructed to permit operators to see without difficulty and should be reasonably comfortable.

(130) Cab windows shall be of safety glass or equivalent, in good condition and shall be kept clean.

(131) Cabs of mobile equipment shall be kept free of extraneous materials.

(132) Adequate back stops or brakes shall be installed on inclined conveyor drive units to prevent conveyors from running in reverse if a hazard to personnel will result.

(133) No person shall be permitted to ride a powerdriven chain, belt or bucket conveyor, unless specifically designed for the transportation of persons.

(134) Equipment operating speeds shall be prudent and consistent with conditions of roadway, grades, clearance, visibility, traffic and the type of equipment used.

(135) Dust control measures shall be taken where dust significantly reduces visibility of equipment operators. Haulage roads shall be wet down as necessary unless dust is controlled adequately by other methods.

(136) Mobile equipment operators shall have full control of the equipment while it is in motion.

(137) 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.

(138) Only authorized persons shall be present in areas of loading or dumping operations.

(139) Unless safe provisions are made for persons to mount or leave equipment while it is in operation, the operator shall be notified of their intentions before getting on or off.

(140) Operators shall assume the normal operating position at all times while the vehicle is in motion and shall sit facing the direction of travel while operating equipment with dual controls.

(141) Men shall not work or pass under the buckets or booms of loaders in operation.

(142) When traveling between work areas, the equipment shall be secured in the travel position.

(143) Dippers, buckets, scraper blades and similar movable parts shall be secured or lowered to the ground when not in use.

(144) Men shall not ride in dippers, buckets, forks, clamshells or other parts of any equipment not specifically designed for the transportation of persons.

(145) Loaded cars or trucks shall not be moved until the loads are trimmed properly.

(146) 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.

(147) Mobile equipment shall not be left unattended unless the brakes are set. The wheels shall be turned into a bank or wall or

shall be blocked when such equipment is parked on a grade.

(148) Men shall not ride on top of loaded haulage equipment.

(149) Men shall not ride outside the cabs and beds of mobile equipment.

(150) Equipment which is to be hauled shall be properly loaded and secured.

(151) Dumping locations and haulage roads shall be kept reasonably free of water, debris and spillage.

(152) Berms, bumper blocks, safety hooks or similar means shall be provided to prevent overtravel and overturning at dumping locations.

(153) If truck spotters are used, they shall be well in the clear while trucks are backing into dumping position and dumping lights shall be used at night to direct trucks.

(154) When overhead clearance is restricted, warning devices shall be installed and the restricted area shall be conspicuously marked.

(155) Ramps and dumps shall be of solid construction, of ample width, have ample side clearance and headroom and be kept reasonably free of spillage.

(156) Lights, flares or other warning devices shall be posted when parked equipment creates a hazard to vehicular traffic.

(157) Tires shall be deflated before repairs on them are started and adequate means shall be provided to prevent wheel-locking rims from creating a hazard during tire inflation.

(158) Any load extending more than four feet (4') beyond the rear of the vehicle body shall be marked clearly with a red flag by day and a red light by night.

(159) A tow bar shall be used to tow heavy equipment. A safety chain shall be used in conjunction with the tow bar.

(160) When heavy equipment is to be towed, the towing vehicle shall be of suitable weight and strength to maintain safe control of the load.

(161) Safe means of access shall be provided and maintained to all working places.



- (162) Crossovers, elevated walkways, elevated ramps and stairways shall be of substantial construction, provided with handrails and maintained in good condition. Where necessary, toeboards shall be provided.
- (163) Ladders shall be of substantial construction, maintained in good condition and regularly inspected.
- (164) Portable straight ladders shall be provided with nonslip bases, shall be placed against a safe backing at the proper angle and set on secure footing.
- (165) Fixed ladders shall be anchored securely and installed to provide at least three inches (3") of toe clearance.
- (166) Fixed ladders shall have substantial railed landing at least every twenty feet (20') unless backguards are provided.
- (167) Steep fixed ladders (seventy degrees to ninety degrees (70°–90°) from the horizontal) twenty feet (20') or more in length shall be provided with backguards, cages or equivalent protection, starting at a point not more than seven feet (7') from the bottom of the ladder.
- (168) Fixed ladders shall project at least three feet (3') above landings or substantial handholds shall be provided above the landings.
- (169) Wooden members of ladders shall not be painted.
- (170) Ladderways, stairways, walkways and ramps shall be kept free of loose rock and extraneous materials.
- (171) Men climbing or descending ladders shall face the ladders and have both hands free for climbing.
- (172) Railed walkways shall be provided wherever persons are regularly required to walk along conveyor belts. Inclined railed walkways shall be nonskid or provided with cleats.
- (173) Openings above, below or near travelways through which men or materials may fall shall be protected by railings, barriers or covers. Where it is impractical to install such protective devices, adequate warning signals shall be posted.
- (174) Scaffolds and working platforms shall be of substantial construction and provided with handrails and maintained in good condition. Floorboards shall be laid properly and the scaffolds and working platforms shall not be overloaded. Working platforms shall be provided with toeboards where necessary.
- (175) Crossovers shall be provided where it is necessary to cross conveyors.
- (176) Moving conveyors shall be crossed only at designated crossover points.
- (177) Slippery walkways shall be provided with cleats and handrails or ropes, or both.
- (178) Regularly used walkways and travelways shall be sanded, salted or cleared of snow and ice as soon as practicable.
- (179) Electric circuits shall be protected against excessive overloads by fuses or circuit breakers of the correct type and capacity.
- (180) Powerlines and telephone circuits shall be protected against short circuits and lightning.
- (181) Electric equipment and circuits shall be provided with switches or other controls. Such switches or controls shall be of approved design and construction and shall be properly installed.
- (182) Individual overload protection or short-circuit protection shall be provided for the trailing cables of mobile equipment.
- (183) Power wires and cables shall have adequate current-carrying capacity and shall be protected from mechanical injury.
- (184) Neither crawler-mounted nor rubber-tired equipment shall run over trailing cables, unless the cables are properly bridged or otherwise protected.
- (185) Distribution boxes shall be provided with disconnect switches.
- (186) Trailing cable and power-cable connections to junction boxes shall not be made or broken under load.
- (187) Power wires and cables shall be insulated adequately where they pass into or out of electrical compartments.
- (188) Power wires and cables which present a fire hazard shall be well installed on acceptable insulators.
- (189) Where metallic tools or equipment can come in contact with bare powerlines, the line shall be guarded or de-energized.
- (190) Telephone and low-potential electric signal wires shall be protected from contacting energized powerlines.
- (191) High-potential transmission cables shall be covered, insulated or placed according to acceptable electrical codes to prevent contact with low-potential circuits.
- (192) The potential on bare signal wires accessible to personal contact should not exceed forty (40) volts.
- (193) Splices in power cables, including ground conductor, where provided, shall be—
- (A) Mechanically strong with adequate electrical conductivity;
 - (B) Effectively insulated and sealed to exclude moisture; and
 - (C) Provided with mechanical protection and electrical conductivity as near as possible to that of the original.
- (194) Shovel trailing cables shall not be moved with the shovel dipper unless cable slings or sleds are used.
- (195) Energized high-potential cables shall be handled with insulated hooks or tongs.
- (196) Electrical equipment shall be de-energized before work is done on such circuits unless hot line tools are used. Switches shall be locked out and suitable warning signs posted by the individuals who are to do the work; locks shall be removed only by authorized persons.
- (197) Principal power switches shall be labeled to show which units they control, unless identification can be made readily by location.
- (198) At least three feet (3') of clearance shall be provided around all parts of stationary electric equipment or switchgear where access or travel is necessary.
- (199) Suitable danger signs shall be posted at all major electrical installations.
- (200) Areas containing major electrical installations shall be entered only by authorized personnel.
- (201) Electrical connections and resistor grids that are difficult or impractical to insulate shall be guarded, unless protection is provided by location.
- (202) Reverse-current protection shall be provided at storage battery charging stations.



(203) All metal enclosing or encasing electrical circuits shall be grounded or provided with equivalent protection. (This requirement does not apply to battery-operated equipment.)

(204) Metal fencing and metal buildings enclosing transformers and switchgear shall be grounded.

(205) Frame grounding or equivalent protection shall be provided for mobile equipment powered through trailing cables.

(206) Continuity and resistance or grounding systems shall be tested immediately after installation.

(207) Electric equipment and wiring shall be inspected by a competent person as often as necessary to assure safe operating conditions.

(208) When a potentially dangerous condition is found, it shall be corrected before equipment or wiring is energized.

(209) Inspection and cover plates on electrical equipment shall be kept in place at all times, except during testing or repairs.

(210) Circuits shall be de-energized before fuses are removed in medium or high voltage circuits.

(211) Fuse tongs or hot line tools shall be used when fuses are removed in medium or high voltage circuits.

(212) Trailing cables shall be clamped to machines in a manner to protect the cables from damage and to prevent strain on the electrical connections.

(213) Surplus trailing cables to shovels, cranes and similar equipment shall be stored in cable boots or on reels mounted on the equipment or otherwise protected from mechanical damage.

(214) Operating controls shall be installed so that they can be operated without danger of contact with energized conductors.

(215) Equipment with booms or masts which are not properly protected shall not be operated where the booms or masts can come within ten feet (10') of an energized overhead powerline.

(216) Overhead high-potential powerlines shall be installed as specified by the *National Electrical Safety Code*.

(217) When equipment must be moved under energized powerlines and the clearance is less than ten feet (10'), the powerlines shall be de-energized or other precautions shall be taken.

(218) Guy wires from poles supporting high voltage transmission lines shall be securely connected to the system ground or be provided with insulators installed near the pole end.

(219) Telegraph, telephone or signal wires shall not be installed on the same crossarm with power conductors. When carried on poles supporting power lines, they shall be installed as specified by the *National Electrical Safety Code*.

(220) Transformers shall be totally enclosed or shall be placed at least fifteen feet (15') above the ground, or installed in a transformer house or surrounded by a substantial fence at least six feet (6') high and at least three feet (3') from any energized parts, casings or wiring.

(221) Transformer enclosures shall be kept locked against unauthorized entry.

(222) Tools and supplies shall be carried in the hands and not on the shoulders when men travel near bare power conductors.

(223) Unguarded conveyors with walkways shall be equipped with emergency stop devices or cords along their full length.

(224) Use of Equipment—Guards.

(A) Gears, sprockets, chains, drive, head, tail; and take-up pulleys, flywheels, couplings, shafts, sawblades, fan inlets; and similar exposed moving machine parts which may cause injury to persons shall be guarded.

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

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

(D) Protruding set screws on revolving parts shall be guarded.

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

(F) Guards shall be sufficiently strong and maintained to provide the required protection.

(G) Stationary grinding machines other than special bit grinders shall be equipped with—

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

2. Adjustable tool rests set as close as practical to the wheel; and

3. Safety washers.

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

(I) Handheld power tools, other than rock drills, 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.

(J) Guards or shields shall be provided in areas where flying or falling materials present a hazard.

(K) Vehicles such as forklifts, trucks, front-end loaders and bulldozers shall be provided with roll bar protection when necessary to protect the operator.

(L) Forklift trucks, front-end loaders and bulldozers shall be provided with substantial canopies when necessary to protect the operator against falling material.

(M) Unsafe equipment or machinery shall be removed from service immediately.

(N) Machinery and equipment shall be operated only by authorized and experienced persons.

(O) Repairs or maintenance shall not be performed on machinery until the power is off and the machinery is blocked against motion, except where machinery motion is necessary to make adjustment or where nonenergized components of large machinery can be safely repaired while the machine is operating.

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

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

(R) 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.

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

(T) Belt dressing shall not be applied manually while belts are in motion unless an aerosol-type dressing is used.

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



(V) Compressed and liquid gas cylinders shall be secured in a safe manner.

(225) Adequate first-aid materials, including stretchers and blankets, shall be provided at places convenient to all working areas. Water or neutralizing agents shall be available where corrosive chemicals or other harmful substances are stored, handled or used.

(226) Safety belts and lines shall be worn when men work where there is danger of falling; a second person shall tend the lifeline when bins, tanks or other dangerous areas are entered.

(227) Life jackets or belts shall be worn where there is danger of falling into deep water.

(228) Protective clothing, rubber gloves, goggles or face shields shall be worn by persons handling substances that are corrosive, toxic or injurious to the skin.

(229) Snug-fitting clothing shall be worn by persons working around moving equipment and machinery.

(230) Protective gloves shall be worn by employees handling materials which may cause injury.

(231) Gloves shall not be worn where they could create a hazard by becoming entwined or caught in moving parts of machinery.

(232) Effective hearing protection shall be worn where noise levels may cause permanent ear damage or hearing loss, or noise shall be reduced to safe levels, unless the wearing of the protective devices would create a greater danger to the employee.

(233) Each place of work shall be visited by a supervisor or a competent person at the beginning of and at least once each shift and more frequently as necessary to ensure that work is being done in a safe manner.

(234) No employee shall be assigned or allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger his/her safety unless s/he can communicate with others, can be heard or can be seen.

(235) When work is performed after dark, the area of drilling, blasting, stripping and loading shall be properly illuminated.

(236) An authorized competent person shall be in charge, at all times, when men are working.

(237) Arrangement shall be made in advance for obtaining emergency medical assistance and transportation for injured persons.

AUTHORITY: sections 286.060 and 293.630, RSMo 1986. Original rule filed Dec. 18, 1975, effective Dec. 28, 1975.*

**Original authority: 286.060, RSMo 1945, amended 1947, 1980 and 293.630, RSMo 1959.*

Op. Atty. Gen. No. 320, Davis (9-3-68). The scope of authority of the Division of Mine Inspection to inspect plants operated in conjunction with the mining of certain minerals is as follows: Lead ore—all operations prior to shipment to the smelter which includes taking the ore from the ground and reducing it to a concentrate; clay—all operations at the mine-site prior to shipment to the kilns or refractories; shale—all operations at the minesite prior to shipment to the cement plants or other available markets; iron ore—all operations prior to shipment to the steel mills which includes reduction to concentrate and formation of pellets; and silica sand—all mining and crushing operations at the mine-site.

Due to similarity of statutes with some rules, see RSMo, section 293.010 for further annotations on related matters.