

MINING CODE

OF THE

STATE OF ARIZONA

Including rules and regulations covering mines, mills, smelters, quarries, sand and gravel operations and the use, storage and transportation of explosives.

REVISED EDITION



Issued by

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STATE MINE INSPECTOR

SEPTEMBER 1969

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RELATING TO THE STATE MINE INSPECTOR, THE STATE MINE DUST ENGINEER AND THE OPERATION OF MINES, MILLS, SMELTERS AND THE AGGREGATE INDUSTRY. AUTHORIZING THE STATE MINE INSPECTOR TO PROMULGATE RULES AND REGULATIONS.

27-121 Qualifications of Mine Inspector; Duties; Deputies; Salary

A. The state mine inspector shall be a resident of this state at least two years prior to his election, not under thirty years of age, and shall have been practically engaged in, and acquainted with, mines and mining in this state, and shall have had at least seven years' experience in underground mining.

B. No person may be an inspector or deputy inspector while an employee, director, or officer, of a mining, milling or smelting company.

C. The inspector, and each deputy, shall devote his entire time to the duties of his office.

D. The inspector shall receive an annual salary of not to exceed twelve thousand dollars and in addition necessary traveling expenses when traveling in discharge of official duties.

E. The inspector shall give bond to the state in the amount of five thousand dollars.

F. The mine inspector shall have a seal bearing the words: "Mine Inspector, State of Arizona", which shall be affixed to official documents.

27-122 Deputy Inspectors

The state mine inspector may appoint six deputies. The deputies shall have the same qualifications as are prescribed for the mine inspector. They shall each receive an annual salary of seven thousand six hundred dollars per annum with necessary traveling expenses as allowed for state officials.

27-123 Cooperation of Inspectors With Mine Dust Engineer

Each deputy state mine inspector shall cooperate with the state mine dust engineer in the prevention and elimination of hazardous dust conditions, and shall immediately notify the state mine dust engineer of any hazardous dust condition which he has reason to believe exists within his district. Each deputy

*ATTENTION—1 § signifies paragraph.
2 §§ signifies paragraphs.

state mine inspector shall be furnished by the state mine dust engineer with a copy of the notice of the existence of any hazardous dust condition in a mine within his district, and a copy of any order for cessation of operations within the mine. Each deputy state mine inspector shall ascertain and report to the state mine dust engineer any failure on the part of a mine operator to install, maintain and operate dust control practices to remedy a hazardous dust condition of which the mine operator has been notified or any violation of an order of the state mine dust engineer given or made pursuant to Sec. 27-142.

Source: §, Ch. 25, L. '43; 65-234, C. '39, Supp. '52.

27-124 Mine Inspections Required; Powers of Inspector

A. The mine inspector shall visit, at least once every three months, every mine in the state employing fifty or more men underground, and at least once each year, every other mine employing six or more men. He shall inspect and examine into the operation, conditions, safety appliances, machinery, sanitation and ventilation, the means of ingress and egress, the means taken to protect the lives, health and safety of the miners, the cause of accidents and deaths occurring in the mine, and the means taken to comply with the provisions of this title.

B. The inspector may at all hours enter and examine any part of any mine, visit, investigate, and examine a plant or equipment connected therewith, or any part of the workings thereof.

C. Operators and their employees shall assist the inspector to make examinations.

Source: §10. Ch. 33, L. '12; §4062, R.S. '13; §2281, R.C. '28; 65-204, C. '39.

27-125 Record of Inspections

After every inspection the inspector shall enter forthwith in a book which shall be kept at the mine and designated the "Record of Inspection", the part of the mine inspected, and the nature of the inspection, and every dangerous defect observed in the mine, machinery and appliances, but nothing contained in or omitted from the entry shall limit or affect the duty and obligation of the owner or operator of the mine under this title. The record shall be open at all reasonable times to the examination of the inspector and any miner.

Source: § 15, Ch. 33, L. '12; §4067, R.S. '13; §2286, R.C. '28; 65-209, C. '39.

27-126. Annual Report to Governor

A. The mine inspector on December 31 each year shall make and file with the governor a statistical summary and report of the work during the year ending November 30. The report shall contain a statement showing the number of men employed in each mine, and, separately, the number of men employed above ground and underground, the number and nature of fatal and serious accidents occurring in each mine, the number of inspections made, complaints filed, inquests attended, mines or mine workings ordered to be vacated, violations found, and other information deemed important, together with necessary or desirable recommendations.

B. Copies of the report shall be published and distributed at the expense of the State.

Source: § 16, Ch. 33, L. '12; § 4068, R.S. '13; § 2287, R.C. '28; 65-210, C. '39.

27-127 Restrictions on Divulging Information by Inspector and Employees; Dismissal for Violation

A. No inspector, deputy or employee shall make a report with respect to a mining property or prospect, except an official report to his superior officer or to the governor, nor shall he make public or reveal to any person knowledge or information obtained by him in the exercise of his official duties concerning ore, ore bodies or values, of any mine or part thereof.

B. An inspector or deputy violating this section shall be dismissed from office.

Source: §8, Ch. 33, L. '12; §4060, R.S. '13; §2280, R.C. '28; 65-203, C. '39.

27-141. State Mine Dust Engineer; Qualifications; Compensation

A. The state mine inspector shall appoint, in addition to the deputies provided for in section 27-122, a deputy called the state mine dust engineer. The person appointed shall be a mining engineer graduated from an accredited school of mining or geology, who is experienced in making dust surveys and who has had not less than three years' actual experience in mining, of which not less than one year was in mine ventilation and dust control work.

B. The state mine dust engineer shall receive a salary of not to exceed nine thousand two hundred dollars per annum and necessary travel expenses as provided for state officials.

C. The state mine inspector shall appoint, in addition to the state mine dust engineer, an assistant state mine dust engineer. The person appointed shall be a mining engineer graduated from an accredited school of mining or geology.

D. The assistant state mine dust engineer shall receive a salary of not to exceed eight thousand four hundred dollars per annum and necessary travel expenses as provided for state officials.

Section 3. Sec. 27-301, Arizona Revised Statutes, is amended to read:

27-301. Definitions.

In this chapter, unless the context otherwise requires:

1. "Excavations" or "workings" means any or all parts of a mine excavated or being excavated, including shafts, tunnels, drifts, crosscuts, adits, entries, winzes, raises, stopes, open cuts, and all working places, whether abandoned or in use.

2. "Inspector" means the state mine inspector and except in article 7 of this chapter his deputies.

3. "Mine" means all mines in the state, and includes all parts of a mine and any mining plant, appurtenant buildings, shops or equipment connected therewith, underground, open pit, sand and gravel, or otherwise, which contributes or may contribute to the mining or extracting of ore, or other metaliferous or non-metalliferous mineral product, excluding hydrocarbon mines.

4. "Underground mine" means any mine in which ore or other material is extracted in a shaft or an adit beneath the surface of the earth.

5. "Open pit" means any mine operated on the surface of the earth, including quarries, but excluding sand and gravel operations.

6. "Sand and gravel operation" means any operation the principal product of which is sand, gravel, pumice or any other common variety of material.

7. "Mill" means any ore mill, concentrator, sampling works, crushing, grinding or screening plant, appurtenant buildings, shops or storage or loading facility used at and in connection with any mine.

8. "Smelter" means any establishment used for the purpose of pyrometallurgical operations and appurtenant buildings, shops, facilities for the production of steam or electrical power, or equipment used in conjunction with any of the above.

9. "Operation" means any mine, mill or smelter defined in this section.

10. "Operator" means the person, association or corporation in immediate possession of an operation as owner or lessee, and, as such, responsible for the management and condition thereof.

Section 4. Repeal.

Sections 27-302 to 27-306, inclusive, Arizona Revised Statutes, are repealed.

Section 5. Title 27, chapter 3, article 1, Arizona Revised Statutes, is amended by adding new sections 27-302 to 27-306, inclusive, to read:

27-302 Operations Subject to Act; Enforcement; Duties of Inspector; Violations; Penalty.

A. All operations shall be subject to the general provisions of this chapter unless specifically exempted from a particular provision by its terms.

B. The provisions of this chapter shall be enforced by the inspector.

C. Any person violating any provision of this chapter shall be guilty of a misdemeanor punishable by a fine of not less than fifty nor more than three hundred dollars.

27-303 Notification to Inspector of Beginning or Suspending Operations.

When mining operations are commenced in any mine or when operations therein are permanently suspended, the operator shall give written notice to the inspector at his office prior to commencement or suspension of operations.

27-304 Operator Responsibility.

A. The operator shall conduct his operation with due regard to health and safety. No operator shall fail to provide or use such safety devices and safeguards as are reasonably necessary to protect the life, health and safety of his employees.

B. The operator, or some responsible person with authority appointed by him, shall be on duty at all times when employees are working. He shall be responsible for the safe performance of all work under him and for the safety of all employees.

C. The operator shall designate a person or persons to inspect as frequently as may be required by any rules or regu-

lations for unsafe conditions and practices, defective equipment and materials, and where such conditions are found, to take appropriate corrective action.

D. The operator and his supervisory personnel shall enforce safety regulations and issue such orders as may be necessary to safeguard the life, health and safety of employees.

27-305 Employee Responsibility.

Each employee shall make full use of all safeguards provided for his protection. Except for the purposes of repair, no employee or other person shall remove, displace, damage, destroy or carry off any safety device or safeguard furnished or provided, nor shall he interfere with the use thereof. No employee or other person shall interfere with the methods or processes adopted for the protection of employees, nor shall he fail or neglect to do anything reasonably necessary to protect the life, health and safety of himself and other employees.

27-306 First Aid; Inspectors as Qualified Instructors

A. Every operation shall have adequate and proper first aid material as approved by the inspector which shall be available to all employees.

B. No employee or other person shall remove material from first aid boxes or kits at any time except for replacement or use in case of injury.

C. The state mine inspector and deputy mine inspectors shall be qualified first aid instructors, and shall provide instruction upon request.

Section 6. Sec. 27-307, Arizona Revised Statutes, is amended to read:

27-307 Notice to Operator of Dangerous Condition; Compliance; Failure to Comply as Prima Facie Evidence of Negligence; Order to Cease Operations.

A. If upon inspection it appears to the inspector that an operation from any cause is in a dangerous condition or its condition fails to comply with the requirements of law, the inspector shall at once serve written notice on the operator or his agent in charge, stating in detail why the operation is dangerous or does not comply with law, and specifying necessary changes to be made and setting a reasonable time within which to make them.

B. The operator shall forthwith make the change and comply with the notice. In an action against a party notified as provided in subsection A for loss of life or bodily injuries by an employee subsequent to the notice and in consequence of

the dangerous condition of the operation, a certified copy of the notice served by the inspector shall be prima facie evidence of the negligence of the operator.

C. If it appears to the inspector from a reexamination that the changes or compliances have not been made within the time specified in the notice, and that the operation is still in a condition dangerous to life or health, and in the opinion of the inspector it is necessary for the safety of the life or health of the employees that the operation be closed, he shall forthwith order cessation of the operation or part thereof, and order that the employees not be permitted therein except to remedy the defects complained of until this chapter is complied with to the satisfaction of the inspector. The operator shall forthwith obey the order.

D. If the operator considers the order to be in excess of the inspector's authority or unreasonable, he may obtain a judicial review of its validity or reasonableness in accordance with the provisions of title 12, chapter 7, article 6.

Section 7. Sec. 27-308, Arizona Revised Statutes, is amended to read:

27-308 Complaint to Inspector of Dangerous Conditions by Employee; Inspection.

When the inspector receives a complaint in writing signed by a person employed in an operation, stating that the operation in which he is working or part of it is being operated contrary to law or is dangerous to the health or lives of persons employed therein, and setting forth when the danger was first observed, the inspector shall examine the operation as soon as possible. The name of the person making the complaint shall not be disclosed by the inspector unless permission is expressly granted by the person. The complaint shall be indexed and filed by the inspector.

Section 8. Sec. 27-309, Arizona Revised Statutes, is amended to read:

27-309 Reports of Fatal Accidents to Inspector; Investigation.

A. When a fatal accident occurs in an operation, the operator shall give immediate notice thereof by telephone or telegraph, and after investigation report the facts in writing to the inspector. The inspector, upon receipt of such notice shall instruct the operator as to preserving evidence of the accident. The inspector shall investigate and make a report which shall be filed in his office.

B. The inspector may appear at a coroner's inquest held respecting the fatal accident and examine the witness.

C. If the inspector concludes the facts warrant it, he shall cause a copy of his report or a copy of the testimony, together with the verdict of the coroner's jury if an inquest was held, and all papers in his possession relating thereto, to be forwarded to the county attorney of the county in which the fatal accident occurred, with an accompanying statement of the inspector, describing in what particular he believes the law has been violated.

Section 9. Sec. 27-310, Arizona Revised Statutes, is amended to read:

27-310 Copy of Law Available for Inspection.

The operator or person in charge of an operation shall keep at all times in the office of the operation and in the time-keeper's office in an accessible place and subject to inspection by all workmen and other interested persons at least one printed copy of this chapter.

Section 10. Title 27, chapter 3, article 1, Arizona Revised Statutes, is amended by adding sections 27-311 to 27-318, inclusive, to read:

27-311 Fire Prevention and Protection.

Every operation where there appears to be any possibility of fire or serious hazards from fire shall provide sufficient fire protection. This shall include water supply with adequate pressure, fireplugs, hose and nozzles, and chemical, automatic chemical or water extinguishers, which shall be properly located to provide for the safety of all employees. All underground mines shall be equipped with adequate rescue equipment and the operators thereof shall provide proper training in its use to rescue crews.

27-312 Safety Equipment.

A. All persons working in operations shall wear approved type head, foot and eye protection when in the work area and such other safety equipment as is designated by the operator.

B. Equipment placed in an operation for the purpose of safety shall not be removed by anyone nor utilized except for the purpose intended.

27-313 Machinery.

A. All moving parts of machinery to which workmen may be exposed shall be adequately guarded. Guards shall conform to the standards set forth in the rules.

B. A guard or safety device necessary for safe operation

which has been removed from any machine shall be replaced before the machine is returned to productive operation.

27-314 Electrical Installations.

All electrical equipment shall be so maintained as to reduce the accident hazard so far as is reasonably possible. Such electrical equipment shall be installed, maintained and used according to standards set forth in the rules.

27-315 Unauthorized Persons.

No person whose entry has not been authorized by the operator shall be allowed in any operation.

27-316 Intoxicating Liquors and Drugs.

No intoxicating liquors or beverages and no narcotic drugs shall be permitted on any operation. No employee or other person under the influence of or believed to be under the influence of intoxicating liquors or narcotic drugs shall enter or be permitted to enter on any operation.

27-317 Waste Dumps and Tailings Areas; Signs; Violation

In areas where waste dumps, subsidence areas or tailings areas border on inhabited or public places, the roads from such places leading into such areas shall be blocked off and danger signs shall be placed at intervals along the perimeter of the areas. Any person removing, destroying or defacing such signs or barriers is guilty of a misdemeanor as provided in section 27-302.

27-318 Abandoned Shafts; Fencing; Violation.

All abandoned shafts, prospect holes or other excavations endangering life or safety shall be securely covered, fenced, or otherwise protected and warning signs posted. Any person removing or destroying any warning sign, covering, fencing, or other protection placed on or around any shaft, prospect hole or other excavation is guilty of a misdemeanor as provided in section 27-302.

Section 11. Sec. 27-321, Arizona Revised Statutes, is amended to read:

27-321 Explosives; Records; Inspection.

A. Every person manufacturing, storing, selling, transferring or in any manner disposing of explosives or blasting agents, shall keep an accurate record of all such transactions and the date thereof, disclosing the amount of each explosive received, from whom received, when received, disposition made

of the explosive with the amount thereof, and the name of the person to whom delivery was made, who shall receipt therefor.

B. The record shall at all times be open to inspection by the inspector or any peace officer engaged in investigating a crime.

Section 12. Sec. 27-322, Arizona Revised Statutes, is amended to read:

27-322 Explosives; Marking; Utilization and Storage.

A. All explosives or blasting agents sold in the state shall be marked with the date of manufacture in the manner prescribed by the inspector. The inspector shall have authority to designate types of explosives or blasting agents which may not be sold or used after twelve months from the date of manufacture.

B. The inspector may regulate and limit the amount of explosives or blasting agents stored or kept in general supply stores in mining camps or mining towns where there is no law governing storage thereof.

Section 13. Sec. 27-323, Arizona Revised Statutes, is amended to read:

27-323 Explosives; Rules and Regulations; Access to Operations.

A. The inspector shall prescribe and promulgate rules in accordance with the provisions of this chapter pertaining to storing, transporting and using explosives and blasting agents in operations, including the character and location of magazines and other structures in which they are stored and the conditions under which they may be transported and designating types of explosives and blasting agents which shall not be stored or used in operations or portions of operations.

B. The inspector shall be accorded free access to any operation in or on which explosives or blasting agents are stored, for the purpose of determining whether magazines and storage facilities conform to law and the rules prescribed and to ascertain that life and property are not endangered by the storage thereof.

Section 14. Sec. 27-324, Arizona Revised Statutes, is amended to read:

27-324 Blasting.

Before firing blasting charges, the blasting crew shall clear the vicinity surrounding the blast site of all personnel, make provision to guard all means of access to the area, and

give warning in every direction from which access may be had to the place where blasting is being done. Misfire holes shall be reported to the mine foreman or the shift boss in charge at the locality of the holes.

Section 15. Sec. 27-325, Arizona Revised Statutes, is amended to read:

27-325 Use of Tamping Bar.

No person shall, whether working for himself or in the employ of another, while loading or charging a hole with explosives, use or employ a metal tamping bar, nor shall any person allow or permit the use of a metal tamping bar while loading or charging a hole by employees under his management or direction.

Section 16. Sec. 27-341, Arizona Revised Statutes, is amended to read:

27-341 Escapement Shafts.

A. Every operator maintaining in a mine a vertical or incline shaft or an adit to a distance greater than one hundred feet and who has drifted a distance of two hundred feet or more and commenced to stope, shall provide and maintain to the hoisting shaft or opening through which men are let into or out of the mine, and where the ore is extracted, a separate escapement shaft, raise or opening, or an underground opening or communication with another contiguous mine. If the contiguous mine is owned or operated by a different person, the right to use the outlet through the contiguous mine, in all cases when necessary, or in case of accident shall be secured and kept in use.

B. Where an escapement shaft or opening is not in existence at the time stoping is commenced, work upon an escapement shaft or opening shall be commenced as soon as stoping begins and diligently prosecuted until completed, and the escapement shaft, raise or opening shall be continued to and connected with the lowest workings in the mine in which mining operations are being conducted.

C. The escapement shaft or exit shall be of sufficient size to afford an easy passageway, and if it is a raise or shaft, shall be provided with substantial ladders from the deepest workings to the surface.

D. When the exit or outlet is not in a direct or continuous course, signboards plainly marked showing the direction to be taken shall be placed at each departure from the continuous course.

Section 17. Sec. 27-342, Arizona Revised Statutes, is amended to read:

27-342 Mine Outlets.

Every mine shall have at least two outlets to the surface except as otherwise provided in this article. The outlets shall not lead to the surface in the same house and shall not at any point be closer to one another than thirty feet. If two outlets of a mine or part of them do not belong to the same mine, the owners and the operators of the respective mines shall be responsible for the outlet or part of it in their respective mines, being kept in proper repair. Should any obstruction arise in an outlet, or anything occur in one of the mines to jeopardize the safety of the outlet, the occurrence shall be immediately reported to the operator of the other mine. If either of the two outlets or part of them is situated in an abandoned mine, the operators of the working mine shall be jointly and severally responsible for the proper maintenance and repair of the outlet.

Section 18. Repeal.

Sections 27-343 to 27-345, inclusive, Arizona Revised Statutes, are repealed.

Section 19. Title 27, chapter 3, article 3, Arizona Revised Statutes, is amended by adding new sections 27-343 to 27-345, inclusive, to read:

27-343 Structures Over Mine Outlet.

No structure shall be erected over an outlet of a mine except the head-frame necessary for hoisting from a shaft and the hatch or door necessary for hoisting from a shaft and the hatch or door required to protect men obliged to work at the top of a shaft from inclement weather, and if a house is required for this purpose the inspector may grant permission in writing for its construction. Such house shall be as small as possible and constructed of fire resistant material. Regular storage of flammable material inside, or within thirty feet of the house is prohibited.

27-344 Timbering Support.

A. Minimum standards for proper timbering or other ground support of any working place shall be suitable to the conditions of the mining system. When necessary such standards shall be set by the inspector after consultation with the operator involved.

B. When any working place has dangerous or hazardous ground no work shall be done there except as shall be neces-

sary to make the place secure and safe. If for any reason necessary timbers cannot be supplied immediately, all work done shall cease until such timbers can be supplied.

C. "Timber" as used in this section shall mean wood, steel, concrete, rock bolts, sand fill, rock fill or any other material or device used for bracing, supporting or restraining ground.

27-345 Shelter Areas.

On every level of an underground mine where mechanical haulage is employed and in which there is not sufficient clearance for employees, unobstructed shelter areas in which employees can find safety from moving trains shall be provided at intervals of not more than two hundred feet.

Section 20. Sec. 27-346, Arizona Revised Statutes, is amended to read:

27-346 Ladder-ways.

Every shaft, winze, raise or incline, of slope steeper than forty degrees from the horizontal, and deeper than forty feet, through which men are obliged to travel, shall be equipped with a suitable ladder-way.

Section 21. Sec. 27-347, Arizona Revised Statutes, is amended to read:

27-347 Construction of Ladder-ways.

A. Permanent ladder-ways shall be strong and firmly fastened, and shall be kept in good repair.

B. In a vertical shaft the inspector may, in his discretion, by an order in writing, direct that the ladder be inclined at the most convenient angle which the space where the ladder is fixed allows, and every ladder shall have substantial platforms at intervals of not more than twenty feet. The platform shall be closely covered, with exception of an opening large enough to permit the passage of a man, and shall be arranged so that a person cannot fall from one ladder through the opening to the next ladder.

C. Ladder-ways shall be provided in shafts in the course of sinking them to within a distance from the bottom as will secure them from damage by blasting. From the end of the ladder-ways, portable ladders shall be extended to the bottom of the shaft.

Section 22. Sec. 27-348, Arizona Revised Statutes, is amended to read:

27-348 Shaft Stations.

Stations or levels shall have a passageway around the working shaft so that crossing over the hoisting compartments may be avoided. Sumps shall be securely covered. At shaft stations a gate or guard rail shall be provided and kept in place across the shaft, except when a cage, skip or bucket is being loaded, but may be temporarily removed for repairs or other operations if proper precaution is taken to prevent danger to persons. The top of the shaft shall be protected by a substantial gate or guard rail.

Section 23. Repeal.

Section 27-349, Arizona Revised Statutes, is repealed.

Sec. 24. Title 27, chapter 3, article 3, Arizona Revised Statutes, is amended by adding a new section 27-349, to read:

27-349 Tracks and Roadbeds; Maintenance Underground.

When mechanical haulage is in an underground mine, the tracks, roadbeds, rails, joints, switches and frogs shall be constructed, installed, bonded and maintained in a manner consistent with the speed and type of haulage operation being conducted.

Sec. 25. Section 27-350, Arizona Revised Statutes, is amended to read:

27-350 Lights; Trolley Wires.

A. Stationary lights which are approved by the inspector shall be provided during working hours at all stations in shafts during the time such shafts are in actual use, and at all stations in levels where hoisting or hauling is conducted by means of machinery, and at night at all working places on the surface.

B. Electric trolley wires shall be at least seven feet above the floor.

Sec. 26. Section 27-351, Arizona Revised Statutes, is amended to read:

27-351 Hoists; Operator; Indicator.

A. No person addicted to intoxicating liquors or drugs, or under eighteen years of age shall be employed as a hoisting engineer.

B. All power hoisting machinery used in hoisting from or lowering employees and materials into mines, except for prospect shafts not exceeding three hundred feet in depth, shall be equipped with an indicator placed near and in clear view or hearing of the engineer. The indicator shall be in addition to marks on the rope, cable or drum.

C. It is unlawful to hoist or lower men from or into a mine at a speed greater than fifteen hundred feet per minute, but the inspector may designate a lesser speed than fifteen hundred feet per minute in a shaft, if in his opinion a greater speed is unsafe, or a greater speed if in his opinion particular shafts and hoist conditions so warrant.

Section 27. Sec. 27-352, Arizona Revised Statutes, is amended to read:

27-352 Inspection and Construction of Hoists.

A. Hoisting machinery, cables and sheaves shall be inspected once every twenty-four hours by a competent person appointed by the operator for that purpose, and the person making the inspection shall immediately report in writing to the operator all defects found.

B. Ropes or cables used for hoisting purposes shall be of approved quality and manufacture. In shafts and winzes over two hundred feet deep, wire ropes or cables only shall be used for hoisting purposes.

C. Head frames where men are hoisted at a speed of over two hundred fifty feet per minute and where more than twenty-five men are employed shall be constructed to allow at least twenty-five feet above the hoist landing stage in which the cage, skip or bucket can travel freely in case of an overwind.

Section 28. Sec. 27-353, Arizona Revised Statutes, is amended to read:

27-353 Safety Cage and Catches.

A. It is unlawful for the operator of a mine to permit hoisting or lowering men in a shaft deeper than three hundred feet except shafts in process of sinking, unless an iron-bonnetted safety cage equipped with gates at least five feet in height is used for hoisting and lowering the men. Every cage or skip used for hoisting men shall be provided with a safety catch of sufficient strength to hold the cage or skip with its maximum load at any point in the shaft in the event the hoisting cable breaks. The inspector shall require that cages and skips be equipped as required by this section and that on all cages the safety catches are kept well oiled and in good working condition.

B. In a shaft less than three hundred feet deep where no safety cage is used, and where cross-heads are used, platforms for employees to ride upon equipped with safety catches as required for cages and skips shall be provided.

C. Skips, the capacity of which exceeds five tons, running on steel guides in shafts designed primarily for the hoisting of rock, need not be equipped with safety catches. Such skips, however, shall be equipped with a platform and bonnet for the protection of the men, who, as provided in this article, may legally ride the skips. Only men engaged in shaft maintenance, pumpmen, skiptenders, supervisors and inspectors shall be permitted to be hoisted or lowered in such skips. No person, including those specifically mentioned in this paragraph, shall be permitted to ride a loaded skip.

Section 29. Sec. 27-354, Arizona Revised Statutes, is amended to read:

27-354. Cross-heads; Buckets.

A. Vertical shafts more than two hundred feet deep from which hoisting is done by a bucket shall be provided with suitable guides, and with the bucket a cross-head traveling upon the guides shall be provided. The height of the cross-head shall be at least one and one-half times its width. If the cross-head is a type not secured to the hoisting rope, a stopper of a design approved by the inspector shall be securely and rigidly fastened to the hoisting rope at a suitable point above the rim of the bucket. The number of persons permitted to ride on the deck of a cage, or, in or on a skip or bucket, shall be determined by the inspector and no more than that number shall be allowed to ride.

B. No persons shall ride upon a cage or in or on a skip or bucket when it is loaded with rock or ore, or when loaded with tools, timber, powder or other material, except for the purpose of assisting in passing it through the shaft.

Section 30. Sec. 27-356, Arizona Revised Statutes, is amended to read:

27-356.—Protection from Falling Materials.

A. Persons engaged in sinking a shaft in which regular hoisting from an upper level is going on, shall be protected from the danger of falling material by a suitable covering, with a sufficient opening left in the covering for the passage of the bucket or conveyance used in the sinking operation.

B. In shafts, winzes or raises where two or more crews of men are working, one crew above another, there shall be a bulkhead or other barrier between each two crews strong enough to stop tools or other material that may fall from the men working above, and only the cage, skip or bucket compartment shall be left open.

C. Shafts or winzes shall have a bulkhead over the men working in the bottom of the shaft or winze built of timber not less than six inches in thickness, not more than fifty feet above the bottom of the shaft or winze, to provide ample protection for the men working in the bottom of the shaft or winze, and so constructed as not to shut off the air circulation. The cage, skip or bucket compartment only shall be left open. Shafts or winzes shall be cleaned down below the bulkhead after each blasting.

D. Windlasses and winches shall be provided with a suitable plug or some other reliable device to prevent the bucket or other conveyance running back.

E. No open hook shall be used with a bucket in hoisting, but only some approved form of safety hook or shackle hook.

Section 31. Sec. 27-357, Arizona Revised Statutes, is amended to read:

27-357. Hoist Release Signal.

A. At a mine where men are hoisted by mechanical means, a hoistman charged with the hoisting shall be kept on duty at the hoist at all times when men are underground, except as provided in subsection B.

B. The requirements of subsection A shall not apply to an automatic hoist equipped with the following devices:

1. A device which automatically cuts off the power to the hoist motor and sets the brakes when the hoist ropes of a winding-drum machine becomes slack, and safety dogs or devices on the cage which will stop the cage in the event of slack rope or a broken hoisting cable.

2. A governor which will prevent unsafe speeds and a device to set the brakes and stop the cage if the safe speed is exceeded.

3. Devices which will reduce the speed of the cage before the approximate stopping points so that it can be stopped properly.

4. A manually operated safety switch and other device by means of which the cage may be stopped, started or directed to another level or stopping point.

5. A call button located at each stop which, when actuated, will cause the cage to move to that stop providing the gates and gate switches are closed on all stations.

6. A magnetic brake which will stop the hoist motor and hold the cage in fixed position whenever the power applied to the hoist motor is removed or fails.

7. An opening or escape hatch in the cage and a shaft manway with ladders which may be reached from the cage.

8. A means of signaling or communicating from the cage to a designated place in the mine or on surface where a responsible person on duty can be notified in the event of an emergency.

C. An automatic hoist is one that does not require the attendance of a hoist engineer and in which the hoist cage and shaft are equipped with operating and safety devices which control the movement of the hoist from the cage and from all stations or levels.

Section 32. Sec. 27-358, Arizona Revised Statutes, is amended to read:

27-358. Signaling Apparatus.

A. Every shaft and each compartment thereof used for hoisting which exceeds fifty feet in depth, and not exempted in writing by the inspector, shall be provided with an efficient means of interchanging distinct and definite signals between the top of the shaft and the lowest level from which hoisting is being done, and the various intermediate levels for the time they are in use.

B. The signaling apparatus shall be either wire or cable actuating a bell, whistle, speaking tube, telephone, electric or electronic system, or two or more of them.

C. Only those employees and supervisors authorized by the operator shall be permitted to ring any shaft or station bells.

Section 33. Sec. 27-359, Arizona Revised Statutes, is amended to read:

27-359. Signal Code.

A. The following signal code shall be used in all mines:

1 Bell, stop immediately if in motion.

1 Bell, hoist muck, after preliminary signal for hoisting muck.

2 Bells, lower.

3 Bells, raise.

3-1 Bells, hoist men.

3-2 Bells, lower men.

4 Bells, release cage, skip, or bucket to the hoistman.

5 Bells, blasting or ready to shoot.

(a) The signal for blasting or ready to shoot is a caution signal and if the engineer is prepared to accept it he shall acknowledge by raising the bucket or cage a few feet then lowering it again.

(b) After accepting the signal for blasting or ready to shoot, the engineer shall be prepared to hoist men away from the blast as soon as any signal is given and shall accept no other signal in the meantime.

6 Bells, air on or off.

7 Bells, danger signal, followed by station signal, calls cage to that station, and such signal takes precedence over all other signals except an accepted blasting signal.

B. The following shall be station signals:

1-2 bells, collar of shaft	2-2-3 bells	26th	level
1-3 bells 1st level	2-2-4 bells	27th	level
1-4 bells 2nd level	2-2-5 bells	28th	level
1-5 bells 3rd level	2-4-1 bells	29th	level
2-1 bells 4th level	2-4-2 bells	30th	level
2-2 bells 5th level	2-4-3 bells	31st	level
2-3 bells 6th level	2-4-4 bells	32nd	level
2-4 bells 7th level	2-4-5 bells	33rd	level
2-5 bells 8th level	2-5-1 bells	34th	level
4-1 bells 9th level	2-5-2 bells	35th	level
4-2 bells 10th level	2-5-3 bells	36th	level
4-3 bells 11th level	2-5-4 bells	37th	level
4-4 bells 12th level	2-5-5 bells	38th	level
4-5 bells 13th level	2-6-1 bells	39th	level
5-1 bells 14th level	4-1-2 bells	40th	level
5-2 bells 15th level	4-1-3 bells	41st	level
5-3 bells 16th level	4-1-4 bells	42nd	level
5-4 bells 17th level	4-1-5 bells	43rd	level
5-5 bells 18th level	4-2-1 bells	44th	level
6-1 bells 19th level	4-2-2 bells	45th	level
2-1-2 bells 20th level	4-2-3 bells	46th	level
2-1-3 bells 21st level	4-2-4 bells	47th	level
2-1-4 bells 22nd level	4-2-5 bells	48th	level
2-1-5 bells 23rd level	4-4-1 bells	49th	level
2-2-1 bells 24th level	4-4-2 bells	50th	level
2-2-2 bells 25th level			

C. The station signal shall be given before the hoisting or lowering signal. If bells run slowly, move slowly.

D. The engineer shall not move a cage, skip or bucket unless he understands the signal.

E. One copy of the signal code provided for by this section shall be posted on the gallows frame on each mine, one at each station and one before the engineer.

F. Special signals may be used if they are easily distinguished by their sound, or otherwise, from the code provided for by this section, and do not interfere with it in any manner.

Section 34. Sec. 27-360, Arizona Revised Statutes, is amended to read:

27-360. Precautions Against Flooding.

A. When advancing a drift, adit, level or incline toward a mine working that appears to be filled with water, a bore hole shall be kept at least twenty feet in advance of the breast of the drive and also, if necessary, in directions laterally from the course of the drive. The working place shall not exceed ten feet in width and further measures shall be taken which are deemed necessary by the inspector to obviate the danger of a sudden breaking through of water. No raise shall be allowed to approach within ten feet of a portion of a winze or a stope in which there is a dangerous accumulation of water, unless the winze or stope is first unwatered by bailing or pumping, or by means of a bore from the raise. When in the opinion of the inspector there is danger of a sudden inrush of water, additional raises, drifts or other workings shall be constructed as necessary to insure escape of persons from the lower workings. Places for the storage of water in mines shall be constructed to prevent leakage as far as possible and insure the safety of the persons working below them.

B. It is unlawful for an operator to impound water or keep water impounded within a mine in which persons are working below the water so impounded in a manner which endangers the safety of the persons unless the water is impounded by a dam or wall approved by the inspector.

Section 35. Sec. 27-363, Arizona Revised Statutes, is amended to read:

27-363. Danger Signals; Visitors.

A. Notices shall be placed at the entrance to working places deemed dangerous, and at the entrance to old or abandoned workings, and no person other than those authorized by

the operator, shall remove or go beyond a caution-board or danger signal so placed.

B. Visitors shall not be allowed underground unless accompanied by the operator or his agent.

Section 36. Sec. 27-364, Arizona Revised Statutes, is amended to read:

27-364. Interfering With Equipment.

No person shall knowingly:

1. Injure or destroy any equipment or machinery of a mine, nor, unless authorized so to do, obstruct, open, close or change the position of a ventilation door, brattice, or airway, or handle or disturb any part of the machinery of the hoisting engine of the mine.

2. Open the door of a mine and neglect to close it.

3. Endanger the mine or those working therein.

4. Disobey a lawful order, or do a wilful act whereby the lives, safety or health of persons working in a mine, the security of a mine, or the machinery connected therewith, is endangered.

Sec. 37. Repeal.

Sections 27-364.01 and 27-365, Arizona Revised Statutes, are repealed.

Section 38. Title 27, chapter 3, article 3, Arizona Revised Statutes, is amended by adding a new section 27-365, to read:

27-365 Regulation of Underground Use of Internal Combustion Engines.

The underground use of any internal combustion engine is declared unlawful, unless after application filed with the inspector he approves the equipment for safe use in the type of underground work for which the application is filed and finds that the atmospheric conditions in the underground workings where the equipment is to be used are such that the operation of such equipment will not endanger the health or safety of any employee. If the application is approved by the inspector, the operation of the designated equipment shall be lawful only if and so long as it is operated and maintained in accordance with recommendations made public from time to time by the inspector, and only upon the condition that when air quality becomes unsafe operation of the equipment shall be stopped by the operator until air quality again becomes safe either by in-

creasing ventilation or by correcting mechanical imperfections in the equipment, whichever is found to be the cause of the unsafe quality of the air.

Section 39. Title 27, chapter 3, article 3, Arizona Revised Statutes, is amended by adding section 27-366, to read:

27-366 Maps of Underground Workings.

When ordered by the inspector, the operator of every underground mine shall make and maintain a reasonably accurate map of the workings of the mine. At least once every six months or oftener if necessary, the operator shall make alterations or additions to the map showing excavations made since those last shown on the map.

All parts of the mine which were worked or abandoned shall be clearly indicated and all underground workings shall be surveyed and mapped before they become inaccessible. The maps shall at all times be open to inspection by the inspector.

Section 40. Title 27, chapter 3, article 3, Arizona Revised Statutes, is amended by adding sections 27-367 to 27-373, inclusive, to read:

27-367 Maintenance and Use of Loading Equipment.

Mucking machines, sorters and other loading devices shall be maintained and operated in a safe manner.

27-368 Ventilation; Condition of Airways; Testing.

A. Every underground working place shall have a sufficient amount of ventilation for employees working in such place.

B. In any underground working place where there is danger of a serious fire, ventilation shall be controlled by mechanical means.

C. The air currents going into underground workings shall have sufficient volume and velocity to direct and carry away smoke and harmful gases from blasting and any other gases or dust which might contaminate the atmosphere.

D. Intake and exhaust airways in underground mines shall be maintained in good condition and free from obstruction.

E. When the atmosphere in any mine or part of a mine is known to contain or is suspected of containing any explosive or toxic gas, the operator shall test it before employees are allowed to work in such mine or part of such mine.

27-369 Evacuation; Procedure; Routes.

Every operator shall have a plan for orderly evacuation in the event of an emergency. Every evacuation route shall be designated by signs and kept open at all times.

27-370 Stench Warning.

A. The operator shall maintain a suitable and sufficient stench warning that can be introduced into the compressed air-lines in case of an emergency and reach all employees who might be working underground.

B. When the odor from a stench warning is detected by employees or other persons, they shall immediately leave their working place or other areas underground, give warning to other employees or persons in their vicinity, and follow the operator's evacuation procedure.

27-371 Radon Control.

Concentrations of radon gas shall not exceed such amounts as may be set by the inspector.

27-372 Uranium Operations; Testing for Radon Daughters.

In all uranium operations the operator shall test regularly for radon daughter concentration and submit such records of testing as may be required to the inspector.

27-373 Cap Lamps.

Permissible cap lamps shall be required in all underground mines where there is a potential hazard from gas.

Section 41. Sec. 27-411, Arizona Revised Statutes, is amended to read:

27-411 Definitions.

In this article, unless the context otherwise requires:

1. "Dust prevention practices" includes ventilation, suction or exhaust methods of removing dust, wet methods for settling dust, and the use of respirators when the condition or exposure is temporary or intermittent, and other means of removing or settling dust from mine air as approved by the state mine dust engineer.

2. A "hazardous dust or gas condition" shall exist when the breathing zone of an employee while engaged in the performance of his work contains higher concentration limits than specified in the following tables:

Toxic Dust and Fumes

Name	Miligrams per Cubic Meter of Air
Antimony5
Arsenic5
Barium5
Cadmium1
Cyanide	5.0
Lead15
Manganese	6.0
Mercury1
Sulphuric Acid	1.0
Tellurium1
Zinc Oxide Fumes	15.0
Uranium (Soluble)05
Uranium (Insoluble)25

Mineral Dusts

Name	Million Particles Per Cubic Foot of Air
Asbestos	5
Dust Without Free Silica	50
Mica Below 5% Free Silica	20
Portland Cement	50
Talc	20
Silica:	
Above 50% Free Si O ²	5
5% to 50% Free Si O ²	10
Below 5% Free Si O ²	50
Slate	50

Gases

Name	Per Cent by Volume
CO ²	0.5
CO	0.01
NO ²	0.0025
O ²	20.
SO ²	0.0005

Dust counts shall be determined in accordance with techniques prescribed by the inspector and shall be made when necessary.

3. "Respirators" means only those respirators approved by the United States Bureau of Mines or which may be approved hereafter by the United States Bureau of Mines and by the state mine dust engineer.

4. "Breathing zone," in the case of persons wearing respirators, is the air space created after the passage of air through the protective device.

Sec. 42. Repeal.

Section 27-412, Arizona Revised Statutes, is repealed.

Sec. 43. Title 27, chapter 3, article 4, Arizona Revised Statutes, is amended by adding a new section 27-412, to read:

27-412 Dust Control.

A. Every operator shall do everything reasonably within his power to encourage good practices in the use of any appliances for allaying dust. Each employee shall use such devices as are furnished by the operator. Employees shall not be allowed to work in hazardous dust or gas concentrations without approved respiratory and eye protection.

B. In every operation where employees are exposed to hazardous dust conditions, some mechanical or other means which will alleviate this condition shall be used whenever and wherever practical.

C. In dry places where the operation of a power drill produces dust, such dust shall be controlled either by wet drilling, spraying, or approved dust catching devices.

Section 44. Title 27, chapter 3, Arizona Revised Statutes, is amended by adding article 5, sections 27-421 to 27-425, inclusive, to read:

ARTICLE 5. OPEN PITS

27-421 Ingress and Egress.

The operator shall provide a safe means of ingress and egress at every open pit or any working place.

27-422 Banks.

A. Banks and benches shall be suitably trimmed in a manner consistent with the kind of rock or material, height of banks, and type of equipment being used.

B. The operator or a supervisor designated by him shall make a daily inspection of the faces and banks in the working area of any open pit and shall cause all dangerous material to be dislodged or otherwise made safe.

27-423 Tracks, Roadbeds and Roadways.

A. Tracks, roadbeds, rails, joints, switches and frogs on all haulageways shall be constructed, installed and maintained in a manner consistent with the speed and type of haulage operations being conducted.

B. Truck haulage roadways shall be constructed and maintained in a manner consistent with the speed and type of haulage operations being conducted. Berms shall be installed and maintained where necessary.

27-424 Operation of Heavy Equipment.

A. The operator shall insure that employees operating any heavy duty equipment such as a locomotive, crane, power shovel, truck, bulldozer, front end loader or scraper are qualified to operate such equipment.

B. Mobile heavy duty equipment shall be inspected regularly and maintained in a safe operating condition.

27-425 Open Pits; Fencing or Blocking.

Those portions or places of open pits which border on inhabited places frequented by the public shall be fenced or otherwise blocked off.

Section 45. Title 27, chapter 3, Arizona Revised Statutes, is amended by adding article 6, section 27-441, to read:

ARTICLE VI.

SAND AND GRAVEL OPERATIONS

27-441 Safety; Rules and Regulations.

All sand and gravel operations shall be conducted with due regard to safety. The inspector shall make rules and regulations to carry out the provisions of this section and shall designate those sections of article 5 of this chapter which shall be applicable to sand and gravel operations.

Section 46. Title 27, chapter 3, Arizona Revised Statutes, is amended by adding article 7, sections 27-461 to 27-469, inclusive, to read:

ARTICLE VII.

RULES AND REGULATIONS

27-461 Definitions.

In this article, unless the context otherwise requires:

1. "Inspector" means the state mine inspector.

2. "Interested parties" means all operators subject to the provisions of this chapter and such other persons who have filed written notice with the inspector of their desire to receive the notices provided for in this article.

3. "Rule" includes every regulation, standard or statement of policy, or interpretation of general application and future effect, including the amendment or repeal thereof, adopted by the inspector, to implement or make specific the laws enforced and administered by him, or to govern the organization or procedure of his office. It shall not include regulations concerning only internal management of the inspector's office, and not directly affecting rights and obligations of interested parties.

27-462 Administration by Inspector; Rules and Regulations.

The inspector shall administer this chapter and may adopt rules reasonably necessary to effectuate the provisions of this chapter.

27-463 Procedure.

Notwithstanding any provisions of law to the contrary, in adopting rules, the inspector shall comply with the procedures set forth in this article.

27-464 Notice of Proposed Adoption of Rule.

A. At least forty-five days prior to the adoption of any rule, notice of the proposed action shall be filed with the secretary of state. Such notice shall include:

1. Reference to the particular section or subsection, or both, which the rule is intended to implement.
2. The express terms of the rule.
3. A statement of the date, time and place of the required hearing.

B. At least forty days prior to the date designated in the notice, the inspector shall mail copies of such notice to all interested parties.

27-465 Hearing.

On the date and at the time designated in the notice, the inspector shall conduct a hearing at which time he shall afford any interested party, his duly authorized representative, or both, the opportunity to present evidence, testimony or statements, either orally or in writing, with respect to the proposed rules.

27-466 Filing Rules With Secretary of State; Mailing to Operators and Interested Parties.

To have any force or effect, every rule adopted by the inspector shall be certified and filed in the office of the secretary of state and copies shall be mailed to all interested parties.

27-467 Effective Date of Rule.

No rule adopted by the inspector shall become effective until thirty days after a certified copy thereof has been filed in the office of the secretary of state and copies have been mailed to all interested parties.

27-468 Declaratory Judgment and Other Remedies.

A. Any person who is or may be affected by a rule adopted by the inspector may obtain a judicial declaration of the validity or reasonableness of the rule by filing an action for declaratory relief in the superior court of Maricopa County in accordance with the provisions of title 12, chapter 10, article 2. In addition to any other ground which may exist, the rule may be declared invalid for a failure to comply with the provisions of this article. The court may restrain or enjoin the enforcement of any rule pending the final determination of the action for declaratory relief.

B. The provisions of this section shall not exclude other remedies available for testing the legality or validity of a rule.

27-469 Exceptions to Rules and Regulations.

In cases where, in the opinion of the inspector, the enforcement of any order or rule would not materially increase the safety of employees and would cause undue hardship on an operator, exceptions may be made at the discretion of the inspector. To be effective such exceptions shall be in writing. Such exceptions can only be revoked after reasonable notice is given in writing to the operator concerned.

23-233 Employment Prohibited to Children Under Eighteen.

A child under the age of eighteen years shall not be employed or allowed to work in, about or in connection with:

1. Blast furnaces, smelters, or ore reduction works.
2. Outside erection and repair of electric wires.
3. Running or management of elevators, lifts, or hoisting machines.
4. Underground operations in a mine.
5. Oiling hazardous and dangerous machinery in motion.

6. Switch tending, gate tending, track repairing, or as brakeman, fireman, engineer, motorman, or conductor upon a railroad.

7. Establishments where nitro-glycerine, dynamite, dualin, guncotton, gunpowder or other high or dangerous explosives are manufactured, compounded or stored.

8. Any other employment declared by the state board of health to be dangerous to the lives or limbs or injurious to the health or morals of children under the age of eighteen.

Source: §18, Ch. 32, L. '12; §27, Ch. 33, L. '12; §§3127, 4079, R.S. '13; §1370, R.C. '28; 56-309, C. '39.

23-261 Employment of Women.

Prohibited Employments; Seats Required for Females Employed in Certain Establishments; Violation; Penalty.

A. Females shall not be employed or allowed to work in or about a mine, quarry or coal breaker, nor in any capacity where the employment compels them to remain standing constantly.

B. Every person employing any female in a place or establishment set forth in §28-231, shall provide suitable seats, chairs or benches for the use of the females employed, at least two seats to every three females and placed where accessible to the employees, and shall permit the use of the seats, chairs, or benches by the employees when they are not necessarily engaged in the active duties for which they are employed.

C. An employer violating this section is guilty of a misdemeanor punishable by a fine of not less than ten nor more than fifty dollars.

Source: §§6, 20, 35, Ch. 32, L. '12; §§3115, 3129, 3144, R.S. '13; §1380, R.C. '28; 56-319, C. '39.

23-282 Mine and Smelter Employees; Exceptions; Violation; Penalty.

A. Employment in underground mines, underground workings, open cut workings, open pit workings, in or about, and in connection with, the operation of smelters, reduction works, stamp mills, concentrating mills, chlorination processes, cyanide processes, cement works, rolling mills, rod mills, coke ovens, blast furnaces, is declared injurious to health and dangerous to life and limb of those employed therein.

B. The period of employment for all persons employed or engaged in work or labor of any kind in underground mines or underground workings of any kind, in open cut workings or open pit workings, or in or about or in connection with the operation of smelters, reduction works, stamp mills, concentrating mills, chlorinating processes, cyanide processes, cement works, rolling mills, rod mills, coke ovens and blast furnaces, shall not exceed eight hours within any twenty-four hour period, and the eight hours shall include the time used in descending to and ascending from the point or place of work in an underground mine or underground workings, or the time used in leaving the surface, of a tunnel, open cut, or open pit workings, for the point or place of work therein, and in returning thereto from the point or place of work.

C. The period of employment prescribed in subsection B may be deviated from in the following instances:

1. In an emergency, where life or property is in imminent danger, the period of labor prescribed in subsection B may be prolonged during the continuance of the emergency.

2. The hours of employment may be changed from one part of the day to another at stated periods, the change not to occur more than once in any two weeks, and the employment may be for more than eight hours during the day in which the change is made.

D. Any person violating any provision of this section, and any person who, as foreman, manager, superintendent, director, or officer of a corporation, or as employer or superior officer of any person, commands, persuades, or allows any person to violate any provision of this section is guilty of a misdemeanor punishable by a fine of not less than two hundred and fifty nor more than five hundred dollars, or by imprisonment in the county jail for not less than three nor more than six months. Upon a trial for a violation of this section, the jury, if the defendant is found guilty by a jury, shall decide whether the punishment shall be a fine or imprisonment, or both fine and imprisonment.

E. Each day this section is violated constitutes a separate offense.

Source: §1, Ch. 28, L. '12; §3147, R.S. '13; §§2, 3, Ch. 28, L. '12; §1, Ch. 26, L. '12, S.S.; §713, P.C. '13; §§1355, 1356, R.C. '28; 56-114, in part, 56-115, C. '39, com'd.

23-283 Hoisting Engineers and Furnace Men; Exception; Violation; Penalty.

A. The period of employment of hoisting engineers at

mines, and furnace men at smelters, shall be eight hours per day except in cases of emergency where life or property is in imminent danger.

B. A person, including the employee, who violates the provisions of this section is guilty of a misdemeanor punishable by a fine of not less than one hundred nor more than three hundred dollars for each offense.

Source: §1, Ch. 18, L. '09; §§1, 2, Ch. 23, L. '12; §§3103, 3109, R.S. '13; §1354, R.C. '28; 56-113, C. '39.

36-641 Industrial Sanitation.

Lavatories, Change and Bath Facilities Required; Obscene Pictures or Writing Prohibited; Violation; Penalty.

A. For the maintenance of public health, proper bathrooms, wash rooms, toilets and a heated change room immediately contiguous to the works shall be provided by every person, whether owner or operator, engaged in the treatment or reduction of ores or metals, in cement works, in works using oils, cyanide, acids or quicksilver. The toilets shall be screened and ventilated with not less than one seat for each twenty-five persons, and one seat for each fraction of that number above ten, employed in the establishment. One shower bath shall be provided for every twenty-five men employed in the establishment with adequate wash room facilities. The rooms and places shall at all times be open to employees and shall be kept in a clean and sanitary condition. A heated wash and change room shall be maintained contiguous to every mine employing twenty-five or more men.

B. Any owner or operator of an establishment as provided in subsection A violating this section, and any person placing any obscene picture, writing or marking in or about the premises mentioned in subsection A, is guilty of a misdemeanor punishable by a fine of not less than fifty nor more than three hundred dollars, by imprisonment in the county jail for not less than ten nor more than sixty days, or both.

Source: §§1-4, Ch. 165, L. '19; §1359, R.C. '28; 56-118, C. '39.

American Table of Distances for Storage of Explosives

As Revised and Approved by The Institute of Makers of Explosives

JUNE 5, 1964

Pounds Over	Explosives Pounds Not Over	Distance in Feet When Storage Is Barricaded			
		Inhabited Buildings	Passenger Railways	Public Highways	Separation of Magazines
10	20	110	45	45	10
40	50	150	60	60	14
100	125	200	80	80	18
150	200	235	95	95	21
300	400	295	120	120	27
500	600	340	135	135	31
900	1,000	400	160	160	36
1,400	1,600	470	190	175	43
2,000	2,500	545	220	190	49
5,000	6,000	730	295	235	65
8,000	9,000	835	335	255	75
10,000	12,000	875	370	270	82
16,000	18,000	940	420	285	94
20,000	25,000	1,055	470	315	105
35,000	40,000	1,275	550	380	124
50,000	55,000	1,460	610	440	140
70,000	75,000	1,655	675	500	160
95,000	100,000	1,815	745	545	185
140,000	150,000	1,900	850	570	235
190,000	200,000	2,030	935	610	285
275,000	300,000	2,275	1,075	690	385

NOTE 1. "Explosives" means any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion, i.e., with substantially instantaneous release of gas and heat, unless such compound, mixture, or device is otherwise specifically classified by the Interstate Commerce Commission.

NOTE 2. "Magazine" means any building or structure, other than an explosives manufacturing building, used for the permanent storage of explosives.

NOTE 3. "Natural Barricade" means natural features of the

ground, such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare of leaves.

NOTE 4. "Artificial Barricade" means an artificial mound or revetted wall of earth of a minimum thickness of three feet.

NOTE 5. "Barricaded" means that a building containing explosives is effectually screened from a magazine, building, railway, or highway, either by a natural barricade, or by an artificial barricade of such height that a straight line from the top of any sidewall of the building containing explosives to the eave line of any magazine, or building, or to a point twelve feet above the center of a railway or highway, will pass through such intervening natural or artificial barricade.

NOTE 6. When a building containing explosives is not barricaded, the distances shown in the Table should be doubled.

NOTE 7. "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, 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.

NOTE 8. "Railway" means any steam, electric, or other railroad or railway which carries passengers for hire.

NOTE 9. "Highway" means any public street or public road.

NOTE 10. When two or more storage magazines are located on the same property, each magazine must comply with the minimum distances specified from inhabited buildings, railways, and highways, and in addition, they should be separated from each other by not less than the distances shown for "Separation of Magazines," except that the quantity of explosives contained in cap magazines shall govern in regard to the spacing of said cap magazines from magazines containing other explosives. If any two or more magazines are separated from each other by less than the specified "Separation of Magazines" distances, then such two or more magazines, as a group, must be considered as one magazine, and the total quantity of explosives stored in such group must be treated as if stored in a single magazine located on the site of any magazine of the group, and must comply with the minimum of distances specified from

other magazines, inhabited buildings, railways, and highways.

NOTE 11. The Institute of Makers of Explosives does not approve the permanent storage of more than 300,000 pounds of commercial explosives in one magazine or in a group of magazines which is considered as one magazine.

NOTE 12. This Table applies only to the manufacture and permanent storage of commercial explosives. It is not applicable to transportation of explosives, or any handling or temporary storage necessary or incident thereto. It is not intended to apply to bombs, projectiles, or other heavily encased explosives.

NOTE 13. All types of blasting caps in strengths through No. 8 cap should be rated at $1\frac{1}{2}$ pounds of explosives per 1,000 caps. For strengths higher than No. 8 cap, consult the manufacturer.

NOTE 14. For quantity and distance purposes detonating fuse up to 60 grains per foot should be calculated as equivalent to 9 lbs. of high explosives per 1,000 feet. Heavier cord loads should be rated proportionately.

ARIZONA MINE SAFETY RULES

Article 1. General Rules

1:01 DEFINITIONS. In these rules, unless the context otherwise requires, the following definitions apply:

1. "ADEQUATE"—Sufficient, safe, reasonable and feasible for intended use.
2. "APPROVED"—Means tested and accepted for a specific purpose by a nationally recognized agency.
3. "COMPETENT PERSON"—Means a person having abilities and experience to fully qualify him to perform the duty to which he is assigned.
4. "FLAMMABLE"—Means capable of being easily ignited and of burning rapidly.
5. "FLAMMABLE LIQUID"—Means liquid having a flash point below 140°F and having a vapor pressure not exceeding 40 P.S.I. (absolute) at 100°F.
6. "WORKING PLACES"—Means any place in or about a mine where work is being performed.
7. "SHALL" and "MUST" are mandatory.
8. "SAND AND GRAVEL OPERATION"—Means any operation the principal product of which is sand, gravel, pumice or any other common variety of material.
9. "ACID PLANT"—Means any operation that manufactures sulfuric acid.
10. "LEACHING"—Means vat leaching, dump leaching and leaching of ore in place.
11. "COMPRESSED AIR RECEIVERS"—Means any vessels of 100 c/f capacity or more which are used for the purpose of receiving and holding compressed air.

1:02 Employees operating equipment are responsible for the safe and proper operation of the equipment they use.

1:03 It is the responsibility of each employee to report to his supervisor any unsafe condition he may see which can cause injury or damage property.

1:04 All injuries shall be reported to the supervisor as soon as reasonably possible.

1:05 Fighting, scuffling, horseplay, harassment, and practical jokes are prohibited.

1:06 Employees operating equipment shall not allow unau-

- thorized personnel to operate or ride on equipment to which they have been assigned.
- 1:07 All employees shall use steps, handrails and/or grab irons when mounting and dismounting mobile equipment.
 - 1:08 Walking or riding on a moving conveyor is prohibited. Approved crossovers shall be used by employees crossing conveyors, unless the conveyor is locked or tagged out.
 - 1:09 Where a potential hazard to employees exists because of use or storage of dangerous chemicals, an adequate source of water shall be provided for protection provided the water does not operate to increase the hazards.
 - 1:10 Warning signs and/or lights, ropes, and temporary guards shall be placed in order to give adequate warning from all unusual hazards.
 - 1:11 Employees operating equipment shall take appropriate precautions to insure that everyone is in the clear before starting machinery or moving equipment.
 - 1:12 Starting and stopping devices on all machinery and equipment shall be clearly marked and readily accessible.
 - 1:13 Guards shall be properly designed and sufficiently strong to provide the required protection and withstand the wear of normal operation.
 - 1:14 Mobile equipment shall be operated at a speed which will not endanger any person or property.
 - 1:15 Mobile equipment shall be secured against accidental movement whenever the equipment operator leaves the equipment.
 - 1:16 All equipment and parts of equipment shall be blocked or otherwise secured so that it cannot be accidentally moved while repair work is being performed.
 - 1:17 Repairs shall not be performed on machinery until the power is off and the machinery is blocked against motion, except where machinery motion is necessary to make adjustments.
 - 1:18 Suitable protection against falling shall be provided for any work required above ground or floor levels.
 - 1:19 Hoist and rigging materials, cables, slings, and hooks shall be inspected for defects as often as is necessary to

- insure adequate safety for the operation and personnel involved.
- 1:20 Suitable catwalks, platforms, or balconies, stairways or fixed ladders shall be provided at all points in conveyor systems requiring lubrication and servicing that are not otherwise readily accessible.
 - 1:21 Flying switches are prohibited on all rail equipment.
 - 1:22 Grizzlies shall be kept in good repair.
 - 1:23 Compressed air shall be bled from air tools and hoses not equipped with automatic air cutoff devices before disconnecting the hoses or leaving the tools unattended.
 - 1:24 All scaffolding, staging, or temporary work platforms shall be adequate in strength and design, and shall be secured against tipping or falling.
 - 1:25 Only one designated employee shall direct the operator of a crane at a given time.
 - 1:26 Portable ladders other than step ladders shall be equipped with non-slip safety shoes. Whenever practical, ladders should be secured against tipping or falling.
 - 1:27 All mobile equipment utilizing air brakes shall have an operating air pressure gauge.
 - 1:28 Fire-fighting equipment shall not be tampered with or removed by any person except for its authorized use.
 - 1:29 No person shall smoke or use an open flame where flammable solvents, liquids, fluids or other flammable materials are stored, transported, handled or used, nor within an unsafe distance of any area or place where such practices may cause a fire or explosion.
 - 1:30 The use of carbon tetrachloride (CCI₄) in fire extinguishers or for cleaning purposes is prohibited.
 - 1:31 All fire extinguishers shall be recharged or replaced as soon as possible after use and a tag with the date attached.
 - 1:32 All tanks, pipes, or other containers which have held flammable, explosive or corrosive material shall be vented, cleaned, purged, and tested for safe and non-explosive atmosphere before entering, burning, cutting, or welding on them is permitted.
 - 1:33 Electrical work shall be performed or supervised by qualified persons.

- 1:34 New electrical equipment shall be installed, maintained and used in accordance with the National Electrical Code.
- 1:35 All electrical equipment installed prior to July 1, 1969, shall be maintained so as to reduce the accident hazard so far as is reasonably possible. Such equipment shall be guarded by rails, wooden platforms, insulating mats, or other electrically non-conductive material wherever necessary.
- 1:36 Electric drills or other electrically operated hand rotating tools shall have the electric switch constructed so as to break the circuit when the hand releases the switch, or shall be equipped with friction or safety devices, and shall be properly grounded.
- 1:37 Before any repair work is started on any power circuit or electrical equipment, the power must be disconnected, and the switches shall be so arranged that they can be locked while repairs are made on machinery or other equipment.
- 1:38 Switches which are open to permit work on lines or equipment must be tagged with warning signs and no persons, other than the person placing these signs or his supervisor may remove them. These warning signs must be signed and dated (including the time of day) by the person placing them.
- 1:39 All electrical equipment, motors, switch boxes, controllers, cable casings, both underground and surface, must be properly grounded.
- 1:40 All compressed air receivers shall be built and installed according to standard specification, and shall be inspected at frequent intervals by a competent person, and a record of such inspections shall be made available for examination.
- 1:41 Each compressed air receiver shall be equipped with a pressure gauge, a pop-off valve and a blow-off valve at its lowest point.
- 1:42 All pipe lines from air receivers shall be adequately supported.
- 1:43 Adequate ladders and ladderways must be provided wherever necessary. All ladders over fifteen (15) feet in height, or sixty (60) degree pitch, shall be securely fastened.
- 1:44 Good housekeeping must be maintained at all times.

- 1:45 No error or omission in these rules and regulations shall be construed as permitting any unsafe, unhealthy or unsanitary condition to exist.
- 1:46 When it is shown that rigid application of, or compliance with, a requirement of any rule or regulations would be to the detriment or serious disadvantage of an operation, or to the employer, or to an employee, exceptions may be granted. But only after thorough investigation and for good cause, and then only by the written permission of the State Mine Inspector.
- 1:47 Roll-over bars, of adequate strength and design, should be provided for all front end loaders and dozers within a reasonable period of time.

Article 2. Explosives and Blasting

Section 1. General Rules

- 2:11 Smoking, matches, open flames, spark-producing devices and carrying of firearms or ammunition shall be prohibited in or within 50 feet of the following areas:
1. Explosive and blasting supply magazines
 2. Blasting agent and oxidizer storage sites
 3. Blasting agent mixing plants (fixed or mobile)
 4. Vehicles transporting explosives, blasting agents or oxidizers
 5. Blasting sites, except for approved means of firing blasts
- 2:12 No persons shall drive, load, or unload a vehicle transporting explosives, blasting agents, or oxidizers in a careless or reckless manner.
- 2:13 The precautions, rules and regulations governing the use, transportation and handling of explosives shall apply to all blasting agents except as otherwise expressly provided herein.

Section 2. Definitions

- 2:21 **BLASTING AGENT:** Shall mean any material or mixture consisting of a fuel and oxidizer, intended for blasting, not otherwise classified as an explosive, and of which none of the ingredients are classified as an explosive, provided that the finished product, as mixed and packaged for use or shipment, cannot be detonated

when unconfined by means of a No. 8 test blasting cap. This test should be conducted at a temperature range between 70° and 75°F.

Note 1. A No. 8 test blasting cap is one containing 2 grams of a mixture of 80% mercury fulminate and 20% potassium chlorate, or a cap of equivalent strength.

Note 2. Nitro Carbo Nitrate. This term applies to any blasting agent which has been classified as nitro carbo nitrate under the Department of Transportation Regulations, and which is packaged and shipped in compliance with the regulations of the Department of Transportation.

EXPLOSIVES: The term "explosive" or "explosives" shall mean any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion, i.e., with substantially instantaneous release of gas and heat, unless such compound, mixture or device is otherwise specifically classified by the Department of Transportation. The term "explosives" shall include all material which is classified as Class A, Class B, and Class C explosives by the Department of Transportation.

Note 1. Classification of explosives by the United States Department of Transportation is as follows:

CLASS A EXPLOSIVES: Possessing detonating hazards; such as dynamite, nitroglycerin, TNT, black powder blasting caps and cast detonating primers and boosters.

CLASS B EXPLOSIVES: Possessing flammable hazard; such as propellant explosives, including some smokeless propellants.

CLASS C EXPLOSIVES: Includes certain types of manufactured articles which contain Class A or Class B Explosives, or both, as components but in restricted quantities.

FUEL: A fuel is a substance which may react with the oxygen in the air or with the oxygen yield by an oxidizer to produce combustion.

MAGAZINE: Shall mean any building or structure, other than an explosives manufacturing building, approved for the storage of explosives.

OXIDIZER: An oxidizer is a substance such as a nitrate

that yields oxygen readily to stimulate the combustion of organic matter or other fuel.

2:22 "AMERICAN TABLE OF DISTANCE" shall mean the latest revision as prescribed by the Institute of Makers of Explosives, 420 Lexington Avenue, New York, New York 10017.

2:23 "NATIONAL ELECTRIC CODE" refers to the Code as prescribed by National Fire Protection Association, 60 Batterymarch Street, Boston, Massachusetts.

Section 3.

2:31 GENERAL PROVISIONS

1. All Class A, Class B, Class C explosives shall be kept in magazines which meet the requirements of this section. This shall not be construed as applying to fuse lighters, fuse igniters, and safety fuses (slow-burning type containing a core of black powder).
2. Blasting caps and electric blasting caps and detonating cord delay connectors shall not be stored in the same magazine with other explosives.
3. Detonating cord shall be stored with explosives when practical but may be stored with caps if the total weight of explosives including that of the detonating cord is taken into account in conforming to the American Table of Distances.

2:32 CLASSIFICATION OF MAGAZINES

1. Magazines as required by this chapter shall be of two classes; namely Class I magazines and Class II magazines.
2. Class I magazines shall be required where the quantity of explosives stored is more than 250 lbs.
3. Class II magazines may be used where the quantity of explosives stored is 250 lbs. or less.

2:33 LOCATION OF MAGAZINES

1. Magazines shall be located away from inhabited buildings, passenger railways, and public highways, and from other magazines in conformity with the American Table of Distances for Storage of Explosives.

2:34 CONSTRUCTION OF MAGAZINES—GENERAL

1. Magazines shall be constructed in conformity with the provisions of this section, or may be of substan-

tially equivalent construction. Magazines for the storage of Class A explosives, other than black powder, shall be bullet-resistant, weather-resistant, fire-resistant, theft-resistant and ventilated. Magazines used only for storage of black powder, Class B and Class C explosives shall be weather resistant, fire-resistant, theft-resistant, and ventilated. Magazines for storage of blasting caps, electric blasting caps, and detonating cord delay connectors shall be weather-resistant, fire-resistant, theft-resistant, and ventilated.

2. Property upon which magazines are located shall be posted with appropriate warning signs. Such signs shall be located so as to minimize the possibility of a bullet traveling in the direction of the magazine if anyone shoots at the sign.
3. Ground around magazines shall slope away for drainage. The land surrounding magazines shall be kept clear of brush, dried grass, leaves and other combustible materials for a distance of at least 25 feet.
4. Field magazines shall not be provided with heat or artificial lights, except that if artificial lights are necessary, an electric safety flashlight or safety lantern shall be used.

2:35 CONSTRUCTION OF CLASS I MAGAZINES

1. Class I magazines shall be of masonry or wood covered with sheet metal, or of metal construction; or a combination of these types. Hollow masonry units used in construction required to be bullet-resistant shall have all hollow spaces filled with a dry sand/cement mix or well-tamped sand. Wood constructed walls required to be bullet-resistant shall have at least a six-inch space between interior and exterior sheathing, and the space between sheathing shall be filled with well-tamped sand or sand/cement mix. Metal wall construction, when required to be bullet-resistant, shall be lined with at least a four-inch thickness of brick, masonry, hardwood or sand.
2. Floors and roofs of masonry magazines may be of wood construction. Wood floors shall be tongue-and-grooved lumber having a minimum thickness of $\frac{3}{4}$ inch. Roofs required to be bullet-resistant shall be protected by four inches of hardwood or by a sand tray located at line of eaves and covering the entire area except that necessary for ventilation. Sand in

the sand tray shall be maintained at a depth of not less than four inches.

3. All wood at the exterior of magazines, excluding eaves, shall be protected by being covered with black or galvanized steel or aluminum metal of thickness of not less than No. 26 gauge. All nails exposed to the interior of magazines shall be well countersunk.
4. Foundations for permanent magazines shall be of substantial construction and arranged to provide good cross ventilation.
5. Magazines shall be ventilated sufficiently to minimize dampness and heating of stored explosives. Ventilation openings shall be screened to prevent the entrance of sparks.
6. Openings to magazines shall be restricted to that necessary for the placement and removal of stocks of explosives. Doors for magazines for Class A explosives shall be bullet-resistant.
7. Magazines shall be provided with substantial means for locking; locks shall be provided and magazine doors shall be kept locked, except during the time of placement and removal of stocks of explosives.
8. Provisions shall be made to prevent the piling of stocks of explosives directly against walls; such protection, however, shall not interfere with proper ventilation at interior of side and end walls.
9. Full and semi-trailers are acceptable for the storage of explosives when modified to comply with Class I magazine construction.

2:36 CONSTRUCTION OF CLASS II MAGAZINES

1. Class II magazines shall be of wood or metal construction, or a combination thereof.
2. Wood magazines of this class shall have sides, bottom and cover constructed of two-inch hardwood boards well-braced at corners and protected by being entirely covered with sheet metal of not less than No. 20 gauge. All nails exposed to interior of magazine shall be well countersunk. All-metal magazines of this class shall have sides, bottom and cover constructed of 12-gauge metal, and shall be lined with $\frac{3}{8}$ -inch plywood or the equivalent. Edges of metal covers shall overlap sides at least one inch.
3. Covers for both wood and metal-constructed magazines of this class shall be provided with substantial strap hinges and shall be provided with substantial

means for locking. Covers shall be kept locked except during the placement or removal of explosives.

4. Magazines of this class shall be painted red and shall bear lettering in white, on all sides and top, at least three inches high, "Explosives—Keep Fire Away." Where necessary due to climatic conditions, Class II magazines shall be ventilated.

2:37 STORAGE WITHIN MAGAZINES

1. Containers of explosives shall be laid flat with top side up. Corresponding grades and brands shall be stored together in such a manner that brand and grade marks show. All stocks shall be stored so as to be easily counted and checked. Containers of explosives shall be piled in a stable manner. When any kind of explosive is removed from a magazine for use, the oldest explosive of that particular kind shall be removed first.
2. Only fiberboard containers of explosives may be opened in a magazine. Opened containers of explosives shall be securely reclosed when stored in a magazine.
3. Tools used for opening containers of explosives shall be constructed of non-sparking materials, except that metal slitters may be used for opening fiberboard containers. A wood wedge and fiber, rubber, or wood mallet shall be used for opening or closing wood containers of explosives.
4. Magazines shall be used for the storage of explosives, blasting agents, and oxidizers, only. Metal tools other than non-sparking transfer conveyors shall not be stored in a magazine.
5. Magazine floors shall be regularly swept, kept clean, dry, free of grit, paper, empty used packages, and rubbish. Brooms and other cleaning equipment shall not have any spark-producing metal parts. Sweepings from floors of magazines shall be disposed of properly. Stained magazine floors shall be cleaned according to instructions obtained from the explosives manufacturer. When any explosive has deteriorated to an extent that it is in a dangerous condition, or if liquid leaks from any explosive, then the person in possession of such explosive shall destroy such explosive in accordance with the instructions obtained from the manufacturer. Only experienced persons shall direct the work of destroying explosives.

6. When magazines need inside repairs, all explosives shall be removed therefrom and the floors cleaned. In making outside repairs, if there is a possibility of causing sparks or fire, the explosives shall be removed from the magazine. Explosives removed from a magazine under repair shall either be placed in another magazine or placed a safe distance from the magazine where they shall be properly guarded and protected until repairs have been completed, when they shall be returned to the magazine.

Section 4. Transportation of Explosives

2:41 Transportation Vehicles

1. Vehicles used for transporting explosives shall be strong enough to carry the load without difficulty and be in good mechanical condition. All vehicles used for the transportation of explosives shall have tight floors and any exposed spark-producing metal on the inside of the body shall be covered with wood or other non-sparking material to prevent contact with containers of explosives. Containers of explosives shall not be loaded above the sides or ends of an open-body vehicle.
2. Motor vehicles transporting explosives shall be marked with appropriate placards or lettering.
3. Motor vehicles transporting explosives must be equipped with not less than two fire extinguishers, each having a rating of at least 6-BC, approved by a nationally recognized fire equipment testing laboratory, and placed on the vehicle where readily accessible when needed.
4. Vehicles transporting explosives shall only be driven by and be in charge of a duly-licensed driver who is physically fit, careful, capable and reliable.
 1. Able to read and write English.
 2. Not addicted to or under the influence of intoxicants or narcotics.
 3. Not less than twenty-one years of age.
 4. Be familiar with all laws, etc.

2:42 Miscellaneous

1. No spark-producing metal tools, oils, matches, fire-arms, ammunition, electric storage batteries, flammable substances, acids, oxidizing materials, or corrosive compounds shall be carried in the body of any motor truck or vehicle transporting explosives un-

less the loading of such dangerous articles and the explosives comply with Department of Transportation regulations.

2. Unauthorized persons or passengers must not ride on a motor vehicle transporting explosives.

Section 5. Water Gels, or Slurry Explosives and Blasting Agents

2:51 General Provisions

1. Unless otherwise set forth in this section, water gels shall be transported, stored, and used in the same manner as explosives or blasting agents in accordance with the classification of the product.

2:52 Premixed Water Gels

1. Premixed water gels containing a substance in itself classified as an explosive shall be classified as an explosive and manufactured, transported, stored, and used as specified for explosives in this Code.
2. Premixed water gels containing no substance in itself classified as an explosive and which are cap-sensitive as defined in Section 2:21 under Blasting Agent shall be classified as an explosive and manufactured, transported, stored, and used as specified for explosives in this Code.
3. Premixed water gels containing no substance in itself classified as an explosive and which are not cap-sensitive as defined in Section 2:21 under Blasting Agent shall be classified as blasting agents and manufactured, transported, stored, and used as specified for blasting agents in this Code.

2:53 On-Site-Mixed Water Gels

1. Ingredients for on-site-mixed water gels shall be stored as set forth in this section.
 - A. Ingredients in themselves classified as Class A or Class B explosives shall be stored in conformity with this Code.
 - B. Prilled, grained, or granulated ammonium nitrate shall be stored in accordance with Section 2:62 of this Code. If ammonium nitrate is stored in the vicinity of explosives or blasting agents, the separation distances specified in Section 2:62 of this Code shall be observed.
 - C. Liquid ammonium nitrate or ammonium nitrate—sodium nitrate solutions shall be stored in tank cars, tank trucks, or permanent tanks. Spills or leaks

which may contaminate combustible materials shall be cleaned up immediately.

2. If electric power is used, it may be furnished by cable from an outside source or by a self-contained motor generator. In the case of a self-contained power source, it shall be located at the end of the storage container opposite that at which the blasting agent is discharged. It shall have adequate capacity for the loads to be expected and be equipped with suitable overload protection devices.
3. Electric wiring carrying voltages greater than 12 volts shall be in armored cable or in conduit and, if dry ingredients are employed, the wiring shall conform to the requirements of Class II, Division 2 of the National Electrical Code. The materials protecting the electric wiring must be of such composition that they will not be chemically attacked by the ingredients being processed.
4. Mixing equipment for on-site-mixed water gels shall comply with the requirements of this section.
 - A. All electric motors, electrically operated proportioning devices, etc., shall be electrically bonded.
 - B. All electric motors, electrically operated proportioning devices, etc., used for dry ingredients shall conform to the requirements of Class II, Division 2 of the National Electrical Code.
 - C. The entire loading and mixing equipment shall be cleaned periodically to insure against accumulations of ingredients.

Section 6. Dry Ammonium Nitrate-Fuel Compositions

2:61 "Mixing plant" refers to any fixed installation or mobile equipment used in conjunction with a mine, for the processing of various non-explosive materials to produce and/or package a blasting agent for use in a mine.

2:62 Mixing Plant, Located on Mine Property

1. At each mining operation where field mixed ammonium nitrate fuel oil blasting agents are being used, all mixing shall be done under the supervision of competent personnel, duly instructed in the proper mixing of the blasting agent involved.
2. Mixing plants shall conform to the requirements of this section unless otherwise specifically approved by the Inspector.

3. Mixing plants shall be located, with respect to the inhabited buildings, passenger railroads, and public highways, in accordance with the American Table of Distances. One half the quantity of unmixed ammonium nitrate shall be included with the quantity of finished product, the total of which shall be considered as explosive, for determining the proper distances.
4. A mixing plant building shall be of noncombustible construction or sheet metal on wood studs.
5. The layout of a mixing plant building shall be such as to provide physical separation between the finished product storage and the mixing and packaging operations.
6. Floors in a mixing plant building shall be of concrete. Concrete floors must have at least one inch of finished cement, Terra Cotta finish, or other material approved by the Inspector. Floors shall be constructed so as to eliminate open floor drains and piping into which molten materials could flow and be confined in case of fire. The floors and equipment of the mixing and packaging room shall be washed down or cleaned when necessary to prevent accumulation of oxidizers or fuels and other sensitizers.
7. Isolated fuel storage shall be provided at fixed plants to avoid contact between molten oxidizer and fuel in case of fire.
8. The mixing plant shall be well ventilated.
9. Heat, if needed, shall be provided exclusively from a unit outside the building.
10. All electric switches, controls, motors, and lights, if located in the mixing or blasting agent storage area, must conform to the requirements of Class II, Division 2, of the most recent edition of the National Electrical Code. The frame of the mixer and all other equipment that may be used must be electrically bonded together and be provided with a continuous path to ground which is separate from the ground provided for power equipment.
11. The design of the mixer shall minimize the possibility of frictional heating, compaction, and especially confinement. All bearings and gears should be mounted outside the mixer and protected against the accumulation of product dust. All surfaces must be accessible for easy cleaning.

12. Mixing and packaging equipment shall be constructed of materials compatible with the ammonium nitrate composition.
13. All discarded empty ammonium nitrate bags and other trash must be disposed of daily by burning outdoors.
14. All sacks or containers used for storage of blasting agents must be properly marked and must show the mixing date.
15. Blasting agents used underground shall be mechanically mixed in order to insure a homogeneous mixture of the proper composition, but the mixing shall not be done underground.

2:63 Composition of Blasting Agents

1. No hydrocarbon liquid fuel with a flash point lower than that of No. 2 diesel fuel oil (125°F. minimum or legal) shall be used.
2. Crude oil and crankcase oil shall not be used.
3. No unusual compositions of blasting agents or a composition containing an ingredient classed as high explosive shall be attempted in mixing operations. The finished product shall be tested regularly to determine that it falls within the classification "Blasting Agent." Peroxides, chlorates, or perchlorates shall not be used under any conditions.
4. If a blasting agent is used underground, its fuel oil content shall range between 5.5% and 6.5% by weight, except where other carbonaceous material is added, in which case a proper oxygen balance shall be maintained.

2:64 Surface Storage of Materials Unmixed Materials

1. Unmixed ammonium nitrate shall be kept in a clean, well-ventilated building or bin, using good warehouse practice. Floor drains into which molten nitrate could run during a fire should be eliminated. Bagged ammonium nitrate shall not be stacked close to any source of heat which might ignite the combustible material of the bags. Bulk ammonium nitrate shall be stored in clean, dry bins. When stored in warehouses, it shall be stored on dry, clean floors which are of noncombustible construction which is protected against impregnation with ammonium nitrate. Warehouses or other storage facilities shall

have adequate ventilation or be of construction that will be self-ventilating to permit escape of products of decomposition and heat in the event of fire.

2. Ammonium nitrate shall not be stored with or near flammable liquids, corrosive acid, chlorates, nitrites, permanganates, sulphur, or finely divided metals.
3. When unmixed ammonium nitrate is stored with blasting agents or high explosives in a high-explosive magazine, one-half the quantity of unmixed ammonium nitrate shall be taken into consideration in computing the total quantity in warehouse or magazine for compliance with the American Table of Distances.
4. Spilled ammonium nitrate shall be cleaned up promptly and removed safely.
5. Dynamite or other explosives shall not be used to break up caked ammonium nitrate.

Mixed Materials (Without Explosives)

1. Permanent storage of blasting agents shall be in a fire and weather-resistant, well-ventilated, magazine or warehouse. Temporary storage may be in vans, truck trailers, railroad cars, etc.
2. The location of magazine or warehouse shall comply with the American Table of Distances.
3. Interior of storage buildings shall be kept clean and be maintained in good housekeeping order.
4. Blasting agents shall not be stored with flammable liquids, corrosive acids, chlorates, nitrites, permanganates, sulphur or finely divided metals.

Mixed Materials (With Explosives)

1. All rules and regulations that apply to the storage of explosives shall apply to the storage of blasting agents when stored with explosives.

2:65 Loading of Blasting Agents General

1. All fittings used in the construction of the hopper and pickup equipment and hose connections of loading equipment must be constructed of materials compatible with the ammonium nitrate composition.
2. Blasting agents shall not be blown into boreholes that contain electrically nonconductive liners, even if the primer is not inserted until after the blowing has been completed.

3. Primers which contain a blasting cap, electric blasting cap or delay electric blasting cap shall not be handled by persons who have previously been operating pneumatic loading devices unless that person has grounded himself to bleed off any static charges.
4. Loading in boreholes containing electric blasting caps, delay electric blasting caps, or blasting caps:
 - A. All pneumatic and air-pressure equipment used for loading blasting agents must be adequately grounded to dissipate static electric charges that may cause premature initiation of the detonator. The machine or hopper, discharge hose, fittings, discharge tube, and loading tube must form a continuous electrically conductive path to a ground. The system ground conductor and loading tube shall have a resistance high enough to prevent hazards from stray currents, yet low enough to adequately maintain static electricity energy below hazardous levels.
 - B. Water lines, air lines, fan lines, rails, or the permanent grounding system shall not be used as a ground for pneumatic loading equipment.
 - C. Loading equipment mounted on a car and rails must be thoroughly insulated from the car and rails and grounded by a separate, static-dissipating ground.
 - D. When loading over electric blasting cap wires, contact between any metal parts of the loader and cap leg wires shall be avoided.
 - E. Metal or other low electrical resistance loading tubes shall not be used.
 - F. All loading equipment must be removed from the area before leg wire shunts are removed and the loaded holes are tied in for blasting.
 - G. Ventilation — When ammonium nitrate blasting agents are used, Section 27-411 of the Arizona Mining Code shall apply.

Section 7. Use of Explosives and Blasting Agents

2:71 General Provisions

1. The handling of explosives may be performed by the person designated to use explosives or by other employees under his direct supervision provided that such employees are at least 18 years of age.
2. Containers of an approved type shall be used for taking detonators and other explosives from storage magazines to the blasting area.

3. Persons authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution, including but not limited to warning signals, flags, barricades or blasting mats to insure the safety of mine personnel.
4. Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by radio transmitters, lightning, dust storms, or other sources of extraneous electricity. All surface blasting operations shall be suspended and persons removed from the blasting area during the approach and progress of an electrical storm.
5. Empty containers and paper and fiber packing materials which have previously contained high explosives shall not be used again for any purpose, but shall be destroyed by burning out of doors, and no person shall be nearer than 100 feet after the burning has started.
6. Explosives, blasting supplies, or blasting accessories that are obviously deteriorated or damaged shall not be used.
7. Explosives or blasting supplies shall not be abandoned. While temporarily unattended, they shall be marked with red flags or some other suitable means of warning persons.

2:72 Loading of Explosives (Blasting)

1. All drill holes shall be sufficiently large to admit freely the insertion of the cartridges of explosives.
2. Drilling shall not be started until all butts (bootlegs) of old holes are examined. Wash down the face and wash out the butts (bootlegs). If any misfires are found they shall be handled only by, or under the direction of, a competent and experienced person.
3. No person shall be allowed to deepen drill holes which have contained explosives.
4. After loading for a blast is completed, all excess explosives and detonators shall be returned immediately to their separate storage magazines.
5. Double priming with fuse in a drill hole is prohibited.

2:73 Initiating Blasts

1. When fuse is used, the blasting cap shall be securely attached to the safety fuse with a standard ring-type (or other approved) cap crimper.

2. No primers shall be assembled or fuse capped closer than 50 feet from any magazine.
3. Only wooden or non-sparking tools shall be used for making holes in a cartridge of explosives.
4. Explosives shall not be extracted from a hole that has once been charged or has misfired unless it is impossible to detonate the unexploded charge by insertion of a fresh additional primer.
5. If there are any misfires while using cap and fuse, all persons shall remain away from the charge for at least 30 minutes. Electrical misfires shall be handled under the direction of the person in charge of the blasting and all wires shall be carefully traced and search made for unexploded charges.
6. Blasters, when testing circuits to charged holes, shall use only blasting galvanometers designed for this purpose.
7. Only the man who makes the leading wire connections in electrical firing shall fire the shot. All connections should be made progressively from borehole back to the source of firing current, and the leading wires shall remain shorted and not be connected to the blasting machine or other source of current until the charge is to be fired.
8. All shaft and winze rounds in shafts or winzes over one hundred (100) feet deep and/or when water is present shall be fired electrically. All rounds in raises over one hundred (100) feet vertically shall be fired electrically or by other means permitting initiation from outside the raise.
9. When blasting electrically, the electric blasting cap leg wire shunt shall not be removed from the leg wires until loading operations have been completed.
10. No person shall ever be alone while engaged in blasting operations but must keep at least one man with him.
11. No safety fuse less than thirty inches in length shall be used.
12. Not over 15 fuses shall be spit by each blaster if being individually ignited.
13. No fuse shall be used that burns faster than one (1) foot in thirty (30) seconds or slower than one (1) foot in fifty-five (55) seconds. The burning rate of every shipment of fuse received at a mine shall be

determined. If a shipment of fuse lasts more than sixty (60) days, the burning rate must be rechecked each sixty (60) days.

- 2:74 Explosives stored in a mine shall be so located that should they explode or burn, escape of the men will not be cut off.
- 2:75 Underground magazines shall be well constructed but need not comply with the standards set by Class I or Class II magazines.
- 2:76 Warning Required
No blast shall be fired until the person in charge has made certain that all surplus explosives are in a safe place, all persons and equipment are at a safe distance or under sufficient cover, and that an adequate warning signal has been given.

Article 3. Hoists, Shafts and Underground Operations

Section 1. Underground Mines

- 3:01 Upon entering a working place employees shall check carefully for hazards such as loose ground and loose timber, bootlegs and missed holes, shall check muck piles for unexploded powder and caps and shall wet down the working area if the ground conditions permit.
- 3:02 Tops of manways and open holes shall be adequately covered or guarded.
- 3:03 Grizzlies shall be used, or adequate guards provided, where muck is dumped or slushed into a raise.
- 3:04 No employee shall get on or off a moving cage, bucket or cross head, nor shall he open cage doors while the cage is moving.
- 3:05 No employee shall carry any material on his shoulder while walking under trolley wires.
- 3:06 No employee shall get on or off of a motor, ore car or man car while train is in motion.
- 3:07 All employees should be familiar with the fire and evacuation procedures for their working area.
- 3:08 In the event of a mine fire, no employee shall attempt any change in ventilation procedures unless so authorized.
- 3:09 Employees engaged in roof bolting in unstable ground shall use stulls and headboards to protect themselves until such time as the bolts are installed and properly tightened.

- 3:10 Mucking machines and slushers or other loading devices, operated by compressed air must have a separate valve at the machine so that they can be shut off without going to the main air line valve.
- 3:11 The air valves on the mucking machines must be kept in a closed position when the machine is not being used.
- 3:12 All mucking machines must be equipped with a step.
- 3:13 No winze or raise shall be in a direct line with a haulage drift unless such a location is essential to the usage to which the winze or raise is to be put. In such exceptions, guards and protective covering must be provided so that hazards of personnel are no greater than would exist if the winze or raise was not in a direct line with the haulage drift.
- 3:14 All air hoses larger than one-inch inside diameter shall have a suitable safety device at machine connections and at double connections.
- 3:15 Electric slusher hoists shall be equipped with back lash guards, rollers, drum covers and anchored securely before slusher operations started. Air slusher hoists used in slushing rock must have an adequate back lash guard placed in front of them.
- 3:16 Loading and drilling at the same time in the same working place is prohibited.
- 3:17 Only a bar blunt on one end may be used in scaling or chute tapping.
- 3:18 All nails or spikes with points projecting shall be bent down or removed.
- 3:19 All workmen shall be forbidden to take "short cuts" across or through dangerous places, and shall travel the regular passageway provided for such purpose.
- 3:20 No workman shall throw tools or material down a manway or raises unless there is a person at the bottom instructed to warn other employees.
- 3:21 When barring down, workman shall stand under timber or safe back when possible, and shall use a bar of proper length.
- 3:22 Only a tool constructed for this purpose shall be used to remove bits from drill steel.
- 3:23 The discharge of any exhaust pipe for an internal combustion engine used for fans, power plant or engine driven compressor shall be located and so arranged that the exhaust fumes from this engine cannot under any conditions get into the intake air of the mine or the intake air of the compressor.

- 3:24 The air intake of all compressors must be located so that no hazardous fumes or smoke can get into the air intake. The use of compressors that have a common crankcase with the internal combustion engine used to drive it is prohibited except for modern machines specifically designed to eliminate the hazard.
- 3:25 All dangerous places shall be properly fenced off and proper danger signals shall be so hung on such fencings that they may be plainly seen.

Section 2. Shafts

- 3:31 All compartments of shafts used for hoisting or lowering men shall be inspected at least once every two weeks and a record of such inspection shall be kept.
- 3:32 Solitary employment in shaft mining or retimbering is forbidden.
- 3:33 Buckets should be stopped about 15 feet above the bottom to await a signal from one of the crew on the bottom for further lowering. After the bucket is loaded it should be raised about three (3) feet from the bottom of the shaft and stabilized before the second signal is given.
- 3:34 No open hooks shall be used to hoist equipment or materials in any shaft.
- 3:35 In shaft sinking, adequate protection from falling ground must be provided. The timber, steel, roof bolts, concrete or any device used for restraining ground must be kept at a reasonable distance from the bottom of the shaft.
- 3:36 No drilling and loading at the same time in the same working place will be permitted.

Section 3. Headframes

- 3:41 The construction of any headframes and the material used therein shall be sufficiently strong and durable to assure its withstanding any working stress put upon it.
- 3:42 All headframes shall be so designed that they will withstand a greater load than the calculated breaking strength of all hoisting attachments.
- 3:43 Any headframes which is constructed of flammable material must be provided with adequate fire protection.
- 3:44 The ladder or stairway leading to the sheave wheel platform shall have a handrail or other guarding as needed and the platform at the sheave wheel shall be protected with guard rails and toe boards.

Section 4. Operations of Underground Trains

- 3:51 The headlight on the front end of the motor shall be kept lighted at all times when the motor is in use. A reflector or tail light must be on the last car of the train.
- 3:52 Workmen shall never walk alongside any train or motor while same is in motion; workmen stationing themselves alongside a drift when a train is passing, should do so in such a manner that they are protected in case of derailments.
- 3:53 Train speed shall be reduced when train is passing men in drifts.
- 3:54 No workmen shall:
1. Ride on locomotive or trains unless authorized.
 2. Ride on top of a full muck car, or carry explosives on any full muck car.
 3. Ride between the cars or between the motor and the cars.
 4. Ride between the motor and a flat car when the motor is pulling a flat car and one or more cars.
 5. Ride between a flat car and the motor when the motor is pulling a loaded or partially loaded flat car.
 6. Ride flat cars except when the flat cars contain special equipment requiring attention; in this case the motor shall proceed very slowly.
 7. Ride on the front platform of a motor moving forward.
 8. Ride the draw-head of a car when it is backing.
- 3:55 Where impaired overhead clearance exists, no person may ride or be placed on top of a motor.
- 3:56 Trains shall be pulled when practical rather than pushed.
- 3:57 Plugging of the trolley locomotives or battery motors not designed for this method of operation shall be permissible IN CASE OF EMERGENCY ONLY.
- 3:58 No one shall sit or stand on the car edge while it is in motion.
- 3:59 No one shall climb over cars without first making sure the train isn't going to move. No one shall climb over trains where there is a live trolley wire.
- 3:60 Plugs must be pulled on Mancha Battery Motors when operator leaves cab.
- 3:61 Men working in haulage drifts must keep the drifts clear of obstruction.

- 3:62 No one shall attempt to operate a motor while out of the cab.
- 3:63 Chute loading installations shall be designed so that men pulling chutes are not required to assume hazardous positions while loading cars.
- 3:64 When coupling, uncoupling, re-railing cars, backing into a drift where men are working, or when spotting cars under chutes, a motorman shall not move his train or motor without first receiving a signal from his swamper or loader.
- 3:65 Cars shall not be coupled or uncoupled by hand where there is not ample room for a person to stand between sides of cars and side of drift. Cars shall not be coupled or uncoupled by hand while a train is in motion. NO FLYING SWITCHES SHALL BE MADE.
- 3:66 Large objects such as picks, shovels or timbers shall not be hauled on motors unless authorized by supervision. EXPLOSIVES shall not be hauled on motors.

Section 5. Cages

- 3:71 Emergency chains shall be used from the cable to the cage in case of a breakage in the king bolt or clevis pin; and also between the upper and lower decks in case of a breakage of the connecting pins for these decks.
- 3:72 The cager shall, when men are being hoisted and lowered, see that the gates are closed before giving the signal to move the cage, and shall be responsible for their closing.
- 3:73 The cagers shall keep a careful watch over the cage during their shifts work and immediately report all defects for repair.
- 3:74 Employees shall not crowd or rush while getting on cages.
- 3:75 No person shall attempt to enter or leave the cage after a signal to move the cage has been given.
- 3:76 To release the cage the signal shall be given while standing upon the station and not upon the cage.
- 3:77 If an employee drops any material or tool down the shaft he shall immediately report the same to the hoisting engineer, who will have the shaft inspected before continuing regular work.
- 3:78 When hoisting or lowering tools, timber or other material in the shaft, the ends, if projecting above the top of the cage of the bucket, shall be securely lashed to the cable or to the upper part of the cage; and tools,

timbers or other materials loaded erectly upon a cage shall be securely lashed before being hoisted or lowered.

- 3:79 The safety dogs on any conveyance used to lower or hoist men must be tested at least once every 24 hours during regular operations. If the mine is shut down for more than eight (8) hours, the safety dogs must be tested before lowering men. A record of such inspection shall be kept and signed by the person making the test.
- 3:80 No person shall smoke on any conveyance used to lower or hoist men, ore or equipment.

Section 6. Hoists: Operator

- 3:91 All mine hoists shall consist of one of the three following drives.
- 1.) V-Belt driven and not less than four V-Belts
 - 2.) Gear driven
 - 3.) Friction driven
- There shall be no chain-driven hoists used for underground operations. All hoists other than automatic hoists must have hand-operated brakes and the brakes must be on the drum.
- 3:92 Hoists shall have rated capacities consistent with the loads handled and the recommended safety factor of the ropes used.
- 3:93 Automatic hoists shall be provided with devices that automatically apply the brakes in the event of power failure.
- 3:94 Flanges on drums should extend radially a minimum of 3 rope diameters beyond the last wrap.
- 3:95 The maximum fleet angle shall not exceed one and one-half degrees for smooth drums and two degrees for grooved drums.
- 3:96 The hoisting engineer shall have a physical examination by a competent physician yearly.
- 3:97 The hoisting engineer shall hold no conversation with anyone while the hoist is in motion or while attending to signals.
- 3:98 The hoisting engineer shall familiarize himself with all signals and use due caution at all times especially when men are being hoisted or lowered.
- 3:99 The hoisting engineer shall report all defects in the shaft, hoist or bell cord to his supervisor as soon as possible.

- 3:100 The hoisting engineer shall not move the cage, skip or bucket until a signal is received and he completely understands the signal.
- 3:101 If for any reason the hoist has been down for eight (8) hours or more, the engineer shall run his cage through the shaft before hoisting or lowering men.
- 3:102 The hoisting engineer must be able to read, write and speak the English language.
- 3:103 In shafts more than six hundred (600) feet deep and/or when one hundred men or more are employed in any 24 hour period underground, man hoists shall be provided with devices to prevent over-travel and over-speed.
- 3:104 Hoist ropes must be inspected regularly and a record of these inspections kept.
- 3:105 All wire cable or rope which is used for hoisting or lowering employees or other persons shall be discarded for such use when:
1. There are six (6) broken wires in pitch length of cable or rope.
 2. The wires on the crown are worn 65% or more of their original diameter.
 3. More than three (3) wires which have been reduced by wear more than 30% in cross section are broken in one strand of the cable or rope lay.
 4. Marked corrosion appears.
 5. The minimum safety factor falls below approved specifications.
- 3:106 It is strictly forbidden to splice any wire cable or rope which is used in hoisting or lowering employees.

Article 4. Underground Diesel Equipment

- 4:01 Pursuant to A.R.S. 27-365, the underground use of any internal combustion engine is unlawful unless the Inspector has approved the equipment. In addition to the approval of the Inspector for use of the equipment, the equipment shall conform in all respects to the requirements of the rules set forth in this article.
- 4:02 Underground diesel-powered equipment shall be equipped with a stainless steel exhaust system including conditioner and satisfactory diluting device, which will reduce toxic gases to a minimum, before they are released into the mine atmosphere. (Except if limestone and water are used, scrubbers may be carbon steel.)
- 4:03 The conditioner must not increase the engine back pres-

sure above eighteen (18) inches of water or one and one-half (1½) inches of mercury when the diesel equipment is developing its rated horsepower. The conditioner must hold sufficient water for four (4) hours operation without replenishing and at the end of four (4) hours of operation, the exhaust temperature again must not exceed one hundred and eighty (180°) Fahrenheit. Water to be completely drained and replenished once each shift. The conditioner must be checked, serviced, and cleaned once each week. Any other conditioner approved by the Arizona State Mine Inspector may be used.

- 4:04 At least once each week an inspection of the diesel engine and the gas conditioner, MUST be made and a written report of its condition be put on file for examination by the Mine Inspector or his deputies.
- 4:05 When flexible tubing is used on exhaust from diesel motor to the air conditioner, or scrubber, it must be the type that will withstand back pressure and not leak.
- 4:06 The use of diesel powered equipment shall be restricted to haulage-way or other working places, where positive ventilation is maintained by mechanical means. If possible, the ventilation in places where diesel equipment is used shall be arranged so that the air carrying exhaust gases from the engine are returned to the main air exhaust ways so as not to traverse working places.
- 4:07 Diesel engines must not be operated when the atmosphere adjacent to its engine contains toxic gases above the tolerance set by United States Bureau of Mines as listed below:
 - Carbon Dioxide -----0.5% by Volume
 - Carbon Monoxide -----0.01% by Volume
 - Oxides of Nitrogen -----0.0005% by Volume
 - Oxygen must be at least 20% by Volume
- 4:08 When a diesel engine is used in underground mine operations, all dead-end headings shall be separately ventilated by auxiliary ventilation with a minimum air velocity of not less than fifty (50) linear feet per minute in the working face itself. The intake of the auxiliary system must be so located that air entering it will not be contaminated by exhaust gases from the diesel engine when operating between the intake and the face of the working area. When any portion of the primary or auxiliary exhaust system is not functioning, no diesel engine shall be allowed to operate in the area of no ventilation.
- 4:09 If diesel equipment other than that approved by U. S.

Bureau of Mines is utilized, 150 C.F.M. per brake horsepower is the required ventilating air for safe operation.

- 4:10 A fire extinguisher of suitable type and size must be carried at all times with each diesel powered unit.
- 4:11 Suitable lights and audible warning devices shall be installed and maintained in good working condition on all mobile diesel equipment operated underground.
- 4:12 The starting mechanism of a diesel engine shall be powered by electricity, air or some other source considered safe. The use of gasoline powered starters for underground diesel equipment is specifically prohibited.
- 4:13 Underground refueling stations must be well ventilated and separate from any underground equipment repair areas. Diesel fuel must be carried in tight containers.
- 4:14 Only a day's supply of diesel fuel will be allowed underground at any time and this **MUST** be stored in tight containers in a cool, well ventilated place. The container will be set in a sufficient amount of suitable absorbent material to absorb all of the fuel being stored, or shall be set in an area which is curbed or otherwise blocked off so that the fuel could not spread beyond the storage area.
- 4:15 No smoking in or around diesel fuel storage. No open lights are permitted in diesel storage or refueling areas. There must be adequate fire fighting equipment at all refueling stations and storage tanks for diesel fuel.
- 4:16 The fuel used in underground diesel equipment must conform to the manufacturer's specifications for viscosity, pour point, cetane number, carbon residue and water. The flash point must not be less than 150°F and sulphur content must not be greater than 0.2 per cent by weight.
- 4:17 As experience indicates, additional rules may be added to the above. When diesel equipment is not operated as set forth by the rules, continued operation of the diesel equipment shall be denied by the Inspector.

Article 5. Open Pits

- 5:01 Loaded blast holes shall be guarded or posted until blasted. All holes shall be blasted within 72 hours after completion of loading. If loaded blast holes are left overnight, reflective warning cones or other adequate warning devices shall be placed around the loaded area.
- 5:02 Dumping over the edge of an undercut stockpile or undercut dumps shall not be permitted.

- 5:03 Haulage equipment shall be kept in gear or appropriate drive range at all times when moving and shall be put in the proper designated gear or range before starting down grade.
- 5:04 Haulage roadways and banks where equipment is working shall be properly maintained and adequate provisions shall be taken to control dust.
- 5:05 The top and backs of all haulage truck cabs working under shovels or under similar hazardous conditions shall be protected by substantial shields.
- 5:06 Illumination sufficient to provide safe working conditions shall be provided in and on all working places.
- 5:07 Haulage vehicle tires shall be deflated to a safe pressure before they are demounted from the vehicle.
- 5:08 Adequate safety devices and/or procedures appropriate to the vehicle shall be used when inflating tires.
- 5:09 Missed holes and misfires shall be reported to the proper supervisor and shall be disposed of safely before any other work is performed in that blasting area.
- 5:10 No equipment shall operate within 20 feet of a loaded hole unless it is equipment necessary for loading or stemming the hole.
- 5:11 Primary blasting and secondary blasting shall not be tied together. They may be blasted at the same time, but connected as different series. A warning signal must be sounded, previous to blasting, to alert employees.
- 5:12 Berms or guards shall be provided on the outer banks of roadways where necessary.
- 5:13 Employees shall not ride in dippers, buckets, forks, clamshells or in the bed of dump trucks for the purpose of transportation.
- 5:14 All trucks, front end loaders, graders and dozers that are operated at night must have lights on both ends as required for safe operations.

Article 6. Sand and Gravel Operations

- 6:01 Moving parts such as gears, sprockets, or chain drive, head tail, and take-up pulleys, flywheels, coupling, shafts, fan inlets, and similar exposed moving machine parts which may be contacted by persons and which may cause injury to persons must be guarded.
- 6:02 Guards at conveyor drive, head and tail pulleys should extend a distance sufficient to prevent a person from

reaching behind the guard and becoming caught between the belt and the pulley.

- 6:03 Protruding set screw keys on revolving parts shall be guarded.
- 6:04 Unsafe equipment or machinery presenting an immediate danger must either be repaired immediately or be otherwise rendered not subject to further use until repaired.
- 6:05 Repairs and maintenance shall not be started on machinery until the power is off and machinery blocked against motion.
- 6:06 Drive belts shall not be shifted while machinery is in motion unless these machines are provided with mechanical shifters.
- 6:07 Whenever possible, welding operations shall be shielded and properly ventilated.
- 6:08 Finger rings should not be worn while working around the plant.
- 6:09 An authorized person should be in charge at all times and visit the working places as often as possible.
- 6:10 Dust control methods must be installed where dust is in excess of state limits.
- 6:11 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.
- 6:12 Loose or torn clothing shall not be worn around moving machinery.
- 6:13 Dippers, buckets, scraper blades and similar moveable parts shall be secured or lowered to the ground when not in use.
- 6:14 Adequate and sufficient ladderways shall be provided at all places where needed. Ladders shall extend three (3) feet above top landing.

Article 7. Acid Plants and Leaching

- 7:01 All employees who work with sulfuric acid or other strong chemicals shall be suitably clothed and properly supervised. Unauthorized persons will not be permitted in areas where these chemicals are being handled.
- 7:02 Sulfuric acid shall be stored in properly vented steel tanks, drums or other approved containers. All distribu-

tion lines shall be of recommended size and approved material.

- 7:03 Approved eye protection, such as chemical safety goggles (dust tight), shall be worn by employees working on or with sulfuric acid storage or distribution installations. Safety hats, safety shoes or boots, and approved gloves shall be required for normal repair work. For a very hazardous job, additional approved type protection shall be provided such as full length face shield, boots, gloves and up to complete protective suits and hoods for maximum exposure.
- 7:04 Open lights, flames and spark producing tools and equipment are forbidden in the vicinity of acid storage vessels and distribution lines where their use might cause an explosion.
- 7:05 All acid storage tanks, drying towers, absorption towers and lines shall be vented, cleaned, purged and tested for explosive mixture before welding, burning or cutting on them is permitted.
- 7:06 Acid spillage shall be removed immediately by flushing the contaminated area with water or by neutralizing the chemical with soda ash, limestone, quicklime or some other absorbent material.
- 7:07 Only authorized personnel will be permitted to operate any equipment in an acid plant.
- 7:08 Personal protective clothing as well as tools and equipment must be thoroughly cleaned up and cared for after each use.
- 7:09 The hazardous nature of inspection, cleaning or repair of large acid storage tanks requires that specific procedures be formulated in advance and approved by the responsible supervisor before work is started.
- 7:10 Fresh water shall be immediately available at the site where acid handling or work on the acid system is being carried on. This will require hauling water where showers and hoses are not conveniently located.
- 7:11 First aid must be started immediately in all cases of contact with sulfuric acid.
- 7:12 Flush acid from eyes by irrigating for at least 15 minutes with a slow stream of water. This is mandatory. There is no alternative.
- 7:13 Treat burns of mouth, throat, esophagus and stomach caused by taking acid internally by having victim drink large quantities of water or milk if he is conscious.

- 7:14 Obtain medical attention as soon as possible after the above first aid measures have been carried out.
- 7:15 The maintenance of plant equipment used in sulfuric service shall be the responsibility of a designated supervisor who shall make periodic inspection of the acid facilities.
- 7:16 Each employee is responsible for reporting to his immediate supervisor all suspected leaks or equipment failure.

Article 9. Smelters

- 9:01 No one shall walk or stand on reverb arch or any part of the flue system unless it has been checked by supervision and known to be safe.
- 9:02 Avoid anything that will cause molten material to splash or explode; keep water away from molten material except where water is required by the process.
- 9:03 Employees engaged in tapping, charging or skimming operations or any similar procedure shall be adequately protected from the hazards of the work by proper shielding if practical or, in its absence, by adequate individual protective covering.
- 9:04 Employees shall stand clear of furnace operations such as skimming, tapping, charging, refining, and casting, unless actually engaged in the work or suitably protected.
- 9:05 Employees shall not enter any flue, dust chamber, furnace, tank or tunnel unless authorized and properly equipped.
- 9:06 When transporting material with the crane, an audible signal shall be sounded by the craneman when necessary to warn men in the path of travel or to give emergency warning.
- 9:07 Before dumping slag in a new place, care shall be taken to see that no employee, person or persons will be endangered by the hot slag and that no explosion hazard exists at the dumping place.
- 9:08 Wet bars shall not be put in molten matte.
- 9:09 Extreme caution should be used around newly cleaned and mudded matte launders when matte first starts to flow.
- 9:10 Employees working at the burner end of the reverb furnace should be on the alert for returning converter slag.

- 9:11 Employees should be on the alert and observe direction of crane movement at all times.
- 9:12 Employees should stay out of the converter aisle while loads are being hauled by the crane, unless their work requires that they be there.
- 9:13 When in converter aisles, employees should not stand under or near slag spouts, or in any location where there is danger of dripping metal or falling objects.
- 9:14 Employees shall not overfill slag, matte or molten copper ladles.
- 9:15 Only authorized persons shall be allowed in the crane cab.
- 9:16 Ladles should be carefully poured to minimize spills.
- 9:17 Appropriate goggles or face shields shall be provided and used when breaking material on the skull breaker and when trimming bullion bars.
- 9:18 Cars should be coupled and uncoupled carefully. Feet shall not be used to align couplings.
- 9:19 Trains should be stopped before they are uncoupled. The wheels of slag pot cars left behind should be blocked to prevent runaways.
- 9:20 Trolley operated slag trains should be kept in the smelter building during electrical storms and trolley pole removed from trolley wire.

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