

VIRGINIA DEPARTMENT OF MINES, MINERALS & ENERGY

DIVISION OF MINES



TOP PERSON

CERTIFICATE STUDY GUIDE

June 15, 2007

Copyright 2007 Commonwealth of Virginia
Commonwealth of Virginia
Department of Mines, Minerals, and Energy
Division of Mines
P.O. Drawer 900
Big Stone Gap, VA 24219
(276) 523-8100



**DEPARTMENT OF MINES MINERALS AND ENERGY
DIVISION OF MINES
DISCLAIMER**

Article 3 of the Coal Mine Safety Laws of Virginia establishes requirements for certification of coal mine workers. The certification requirements are included in §45.1-161.24 through §45.1-161.41 in which the Board of Coal Mining Examiners is established for the purpose of administering the certification program. The Board has promulgated certification regulations 4 VAC 25-20, which set the minimum standards and procedures required for Virginia coal miner examinations and certifications.

The Virginia Department of Mines Minerals and Energy, Division of Mines developed this study guide to better train coal miners throughout the mining industry. The study guide material should be used to assist with the knowledge necessary for coal mining certifications. The material is not all-inclusive and should be used only as an aide in obtaining knowledge of the mining practices, conditions, laws and regulations. This material is based upon the Coal Mining Safety Laws of Virginia, Safety and Health Regulations for Coal Mines in Virginia, Title 30 Code of Federal Regulations (30 CFR), State and Federal Program Policy Manuals and other available publications. Nothing herein should be construed as recommending any manufacturer's products.

The study guide and materials are available at the Department of Mines, Minerals and Energy. Any questions concerning the study guide should be addressed to the Regulatory Boards Administrator at the Big Stone Gap Office.

TABLE OF CONTENTS

	<u>Page(s)</u>
Introduction	4
Purpose and Scope	5
Section 1 Coal Mine Safety Laws of Virginia	6 - 21
Section 2 Code of Federal Regulations – Title 30	22 - 32
Section 3 Additional Safety Requirements	33 – 34
Section 4 Sample Questions	35 - 38
References	39

INTRODUCTION

Article 3 of the Coal Mine Safety Laws of Virginia establishes requirements for certification of coal mine workers. The certification requirements are included in section §45.1-161.24 through §45.1-161.41 in which the Board of Coal Mining Examiners is established for the purpose of administering the certification program. The Board has promulgated certification regulations 4 VAC 25-20, which set the minimum standards and procedures required for Virginia coal miner examinations and certifications.

Each applicant for a top person certificate shall demonstrate to the Board of Coal Mining Examiners by written oral examination that he has thorough knowledge of the theory and practice of shaft and slope mine construction. In addition, each applicant shall pass the examinations in first aid* and gas detection. The holder of a top person certificate issued by the Board shall be authorized to act as top person at any coal mine.

*First Aid for Miners Study Guide will be used for this section requirement of the certification exam.

PURPOSE AND SCOPE

Purpose

The purpose of the Top Person Certification Study Guide is to assist a qualified applicant in obtaining the Top Person certification. The Board of Coal Mining Examiners (BCME) may require certification of persons who work in coal mines and persons whose duties and responsibilities in relation to coal mining require competency, skill or knowledge in order to perform consistently with the health and safety of persons and property.

Scope

The applicant for Top Person must possess at least one year of practical mining experience and 30 days top person experience under the direction of a certified top person or appropriately related work experience approved by the Chief of the Division of Mines. The applicant for top person certification must also hold a General Miner Certification and have received current first aid training (MSHA first aid 5000-23 acceptable).

The top person certification authorizes the holder to:

- Assist in coordinating activities at the top of the shaft collar or slope drift,
- Make preparations for miners entering the shaft or slope, and
- Act as a communications link between employees in the shaft or slope with others (such as a hoist/crane operator) located on the surface.

SECTION 1 COAL MINE SAFETY LAWS OF VIRGINIA

45.1-161.12. Prohibited acts by miners or other persons; miners to comply with law.

- A. No miner or other person shall (i) knowingly damage any shaft, lamp, instrument, air course, or brattice or obstruct airways; (ii) carry in a mine any intoxicating liquors or controlled drugs without the prescription of a licensed physician; (iii) disturb any part of the machinery or appliances in a mine; (iv) open a door used for directing ventilation and fail to close it again; (v) enter any part of a mine against caution; or (vi) disobey any order issued pursuant to the provisions of this Act.
- B. Each miner at any mine shall comply fully with the provisions of this Act and other mining laws of the Commonwealth that pertain to his duties.
- C. Any individual shall, upon the order of the Chief, complete training that addresses the subject of any violation issued to the individual as a condition for abatement of the violation.

45.1-161.28. Certification of certain persons employed in coal mines; powers of Board of Coal Mining Examiners.

- A. The Board of Coal Mining Examiners may require certification of persons who work in coal mines and persons whose duties and responsibilities in relation to coal mining require competency, skill or knowledge in order to perform consistently with the health and safety of persons and property. The following certification shall be authorized to perform the tasks which this Act or any regulation promulgated by the Board or by the Department requires to be performed by such a certified person.
 - 7. Top person;

45.1-161.29 Examinations required for Coal Mining Certifications

- A. The Board of Coal Mining Examiners may require examination of applicants for certification. The Board may require such other information from applicants as may be necessary to ascertain competency and qualifications for each task. Except as specifically provided by this Act, the Board shall prescribe the qualifications for any certification. The examinations shall be conducted under such rules, conditions and regulations as the Board shall promulgate. Such rules, when promulgated, shall be made a part of the permanent record of the Board, shall periodically be published and shall be of uniform application to all applicants.
- B. Any certificate issued by the Board shall be valid from the date of issuance unless and until it has been suspended pursuant to 45.1-161.34 or has been revoked by the Board pursuant to 45.1-161.35.

45.1-161.30. Performance of certain tasks by uncertified persons; penalty.

- A. It shall be unlawful for any person to perform any task requiring certification by the Board of Coal Mining Examiners until he has been certified. It shall also be unlawful for an operator or his agent to permit any uncertified person

to perform such tasks. A violation of this subsection shall constitute a Class 1 misdemeanor. Each day of operation without a required certification shall constitute a separate offense.

45.1-161.41. Top person certificate.

Each applicant for a top person certificate shall demonstrate to the Board of Coal Mining Examiners by written examination that he has thorough knowledge of the theory and practice of shaft and slope mine construction. In addition, each applicant shall pass the examinations in first aid and gas detection. The holder of a top person certificate issued by the Board shall be authorized to act as top person in any coal mine.

45.1-161.126. Surface storage of explosives.

- A. Separate surface magazines shall be provided for the storage of explosives and detonators.
- B. Surface magazines for storing and distributing explosives in amounts exceeding 150 pounds shall be:
 - 1. Reasonably bulletproof and constructed of incombustible material or covered with fire-resistive material. The roofs of magazines so located that it is impossible to fire bullets directly through the roof from the ground need not be bulletproof, but where it is possible to fire bullets directly through them, roofs shall be made bullet-resistant by material construction, or by a ceiling that forms a tray containing not less than a four-inch thickness of sand, or by other methods;
 - 2. Provided with doors constructed of three-eighth inch steel plate lined with a two-inch thickness of wood, or the equivalent;
 - 3. Provided with dry floors made of wood or other nonsparking material and have no metal exposed inside the magazine;
 - 4. Provided with suitable warning signs so located that a bullet passing directly through the face of a sign will not strike the magazine;
 - 5. Provided with properly screened ventilators;
 - 6. Equipped with no openings except for entrance and ventilation;
 - 7. Kept locked securely when unattended; and
 - 8. Electrically bonded and grounded if constructed of metal.
- C. Surface magazines for storing detonators need not be bulletproof, but they shall conform to the other provisions of subsection B regarding the storage of explosives.
- D. Explosives in amounts of 150 pounds or less or 5,000 detonators or less shall be stored in accordance with preceding standards or in separate locked box-type magazines. Box-type magazines may also be used as distributing magazines when quantities do not exceed those mentioned. Box-type magazines shall be constructed strongly of two-inch hardwood or the equivalent. Metal magazines shall be lined with nonsparking material. No magazine shall be placed in a building containing oil, grease, gasoline, wastepaper or other highly flammable material; nor shall a magazine be placed within 20 feet of a stove, furnace, open fire or flame.

- E. Magazines shall be located not less than 300 feet from any mine opening. However, in the event that a magazine cannot be practicably located at such a distance, a magazine may be located less than 300 feet from any mine opening, if it is sufficiently barricaded and approved by the Chief. Unless approved by the Chief, magazines shall not be located closer to occupied buildings, public roads, or passenger railways than allowed in the "American Table of Distances for Storage of Explosive Materials."
- F. The supply kept in distribution magazines shall be limited to approximately a 48-hour supply, and such supplies of explosives and detonators may be distributed from the same magazine, if separated by at least a four-inch substantially fastened hardwood partition or equivalent barrier.
- G. The area surrounding magazines for not less than 25 feet in all directions shall be kept free of rubbish, dry grass or other materials of a combustible nature.
- H. If the explosives magazine is illuminated electrically, vapor-proof lamps shall be installed and wired so as to present minimum fire and contact hazards.
- I. Only nonmetallic tools shall be used for opening wooden explosives containers. Extraneous materials shall not be stored with explosives or detonators in an explosives magazine. Only nonmetallic tools shall be used for opening wooden explosives containers. Extraneous materials shall not be stored with explosives or detonators in an explosives magazine.

45.1-161.127. Underground transportation of explosives.

- A. Explosives or detonators carried anywhere underground by any person shall be in individual containers. Such containers shall be constructed substantially of nonconductive material, maintained in good condition, and kept closed.
- B. Explosives or detonators transported underground in cars moved by means of a locomotive or rope, or in shuttle cars, shall be in substantially covered cars or in special substantially covered containers used specifically for transporting detonators or explosives, and only under the following conditions:
 - 1. The bodies and covers of such cars and containers shall be constructed or lined with nonconductive material;
 - 2. If explosives and detonators are hauled in the same explosive car or in the same special container, they shall be separated by at least a four-inch substantially fastened hardwood partition or equivalent barrier;
 - 3. Explosives, detonators, or other blasting devices shall not be transported on the same trip with miners;
 - 4. When explosives or detonators are transported in special cars or containers in cars, they shall be hauled in special trips not connected to any other trip; however, this shall not prohibit the use of such additional cars as needed to lower a rope trip, or to haul supplies including timbers. Materials so transported shall not project above the top of the car. In no case shall flammable materials such as oil or grease be hauled on the same trip with explosives; and
 - 5. Explosives or detonators shall not be hauled into or out of a mine within five minutes preceding or following a man-trip or any other trip. If traveling against the air current, the man-trip shall precede the explosives

- trip; if traveling with the air current, the man-trip shall follow the explosives trip.
- C. In low coal seams where it is impractical to comply with subsection B, explosives may be transported in the original and unopened case, or in suitable individual containers, to the underground distribution magazine.
 - D. Explosives and detonators shall be transported underground by belt only under the following conditions:
 - 1. They shall be transported in the original and unopened case, in special closed cases constructed of nonconductive material, or in suitable individual containers;
 - 2. Clearance requirements shall be the same as those for transporting miners on belts;
 - 3. Suitable loading and unloading stations shall be provided; and
 - 4. Stop controls shall be provided at loading and unloading points, and an authorized person shall supervise the loading and unloading of explosives and detonators.
 - E. Neither explosives nor detonators shall be transported on flight or shaking conveyors, scrapers, mechanical loading machines, locomotives, cutting machines, drill trucks, or any self-propelled mobile equipment; however, this shall not prohibit the transportation of explosives or detonators in special closed containers in shuttle cars or in equipment designed especially to transport such explosives or detonators.

45.1-161.132. Explosives and blasting practices in shaft and slope operations.

- A. Blasting areas in shaft or slope operations shall be covered with mats or materials when the excavations are too shallow to retain the blasted material.
- B. If explosives are in the shaft or slope when an electrical storm approaches, all miners shall be removed from such working places until the storm has passed.

45.1-161.153. Hoisting equipment.

- A. All hoists used for handling men shall be equipped with overspeed, overwind, and automatic stop controls.
- B. All suspended work decks and platforms (i) shall operate automatically, (ii) shall be equipped with guardrails capable of protecting men and materials from accidental overturning, and (iii) shall be equipped with safety belts and such other protective devices as the Chief shall require by regulation.
- C. Any platform or work deck used for transporting miners or materials shall be equipped with leveling indicators and such conveyance shall be maintained and operated in a reasonably level position at all times.
- D. Slope, shaft, or surface incline hoists shall be equipped with brakes capable of stopping and holding the fully loaded unbalanced cage or trip at any point in the shaft or slope or on the incline.
- E. An accurate and reliable indicator showing the position of the cage or trip shall be placed so as to be in clear view of the hoisting engineer, unless the position of the car or trip is clearly visible to the hoisting engineer or other person operating the equipment at all times.

- F. Any conveyance used to haul miners or materials within a shaft or slope (i) shall be designed to prevent materials from falling back into the shaft or slope and (ii) shall be equipped with a retaining edge of not less than six inches to prevent objects from falling into the shaft or slope.

45.1-161.154. Hoisting ropes.

- C. The hoisting rope shall be fastened to its load by a spelter-filled socket or by a thimble and adequate number of clamps properly spaced and installed.
- D. Any cage, man-car, or trip used for hoisting or lowering men with a single rope shall be provided with two bridle chains or wire ropes connected securely to the rope at least three feet above the socket or thimble and to the crosspiece of the cage or to the man-car or trip.
- E. When equipment or supplies are being hoisted or lowered in the slope, safety chains or wire ropes shall be provided and connected securely to the hoist rope. In addition, visible or audible warning devices shall be installed in the slope where they may be seen or heard by persons approaching the slope track entry from any access.

45.1-161.155. Hoisting cages.

- A. Cages used for hoisting miners shall be of substantial construction and shall have (i) adequate steel bonnets, with enclosed sides; (ii) gates, safety chains, or bars across the ends of the cage when men are being hoisted or lowered; and (iii) sufficient handholds or chains for all men on the cage to maintain their balance. A locking device to prevent tilting of the cage shall be used on all self-dumping cages when miners are transported thereon.
- B. The floor of the cage shall be constructed so that it will be adequate to carry the load and so that it will be impossible for a miner's foot or body to enter any opening in the bottom of the cage.
- C. Cages used for hoisting miners shall be equipped with safety catches that act quickly and effectively in case of an emergency. The provisions of this subsection shall not apply to capsules or buckets used for emergency escape or used during slope or shaft sinking.

45.1-161.156. Slope and shaft conditions.

- A. All shafts shall be equipped with safety gates at the top and at each landing. Safety gates shall be kept closed except when the cage is being loaded or unloaded.
- B. Positive-acting stopblocks or derails shall be installed near the top and at intermediate landings of slopes and surface inclines and at the approaches to all shaft landings.
- C. Positive-acting stopblocks or derails shall be installed on the haulage track in the slope near the top of the slope. The stopblocks or derails shall be in a position to hold or stop any load, including heavy mining equipment, to be lowered into the mine until such time as the equipment is to be lowered into the mine by the hoist.

- D. At the bottom of each hoisting shaft and at intermediate landings, a runaround shall be provided for safe passage from one side of the shaft to the other. This passageway shall be not less than five feet in height and three feet in width.
- E. Ice shall not be permitted to accumulate excessively in any shaft where miners are hoisted or lowered.

45.1-161.157. Signaling; signal code.

- A. Two independent means of signaling shall be provided between the top, bottom, and all intermediate landings of shafts, slopes, and surface inclines and the hoisting station. At least one of these means of signaling shall be audible to the hoisting engineer or other person operating the equipment. Bell cords shall be installed in shafts in such a manner as to prevent unnecessary movement of such cords within the shaft.
- B. A uniform signal code approved by the Chief shall be in use at each mine and shall be at the cage station designated by the mine foreman.

45.1-161.158. Inspections of hoisting equipment.

- A. Before hoisting or lowering miners in a shaft, the hoisting engineer shall operate empty cages up and down each shaft at least one round trip at the beginning of each shift and after the hoist has been idle for one hour or more.
- B. Before hoisting or lowering miners in slope and surface incline hoisting, the hoisting engineer shall operate empty cages at least one round trip at the beginning of each shift and after the hoist has been idle for one hour or more.
- C. The hoisting engineer, at the time the inspections required by subsections A and B are performed, shall (i) inspect all cable or rope fastenings at all cages, buckets, or slope cars; (ii) inspect hammer locks and pins, thimbles, and clamps; (iii) inspect safety chains on buckets, cage or slope cars; (iv) inspect the braking system for malfunctions; (v) clean all excess oil and extraneous materials from the hoist housing construction; (vi) inspect the overwind, overtravel, and lilly switch or control from stopping at the collar and within 100 feet of the work deck; and (vii) check communications between the top house, work deck and work deck tugger house.
- D. Hoisting rope on all cages or trips shall be inspected at the beginning of each shift by the hoisting engineer.
- E. A test of safety catches on cages shall be made at least once each month. A written record shall be kept of such tests, and such record shall be available for inspection by interested persons.
- F. Hoisting equipment including the headgear, cages, ropes, connections, links and chains, shaft guides, shaft walls, and other facilities shall be inspected daily by an authorized person designated by the operator. Such person shall also inspect all bull wheels and lighting systems on the head frame. Such person shall report immediately to the operator, or his agent, any defects found, and any such defect shall be corrected promptly. The person making such examination shall make a daily permanent record of such inspection, which shall be available for inspection by interested persons. If a hoist is used only during a weekly examination of an escapeway, then the inspection

required by this subsection shall only be required to be completed weekly before the examination occurs.

45.1-161.160. Operations of hoisting equipment.

- A. When moving the platform or work deck, all miners traveling thereon shall have safety belts secured.
- B. No person shall ride on a loaded cage.
- C. The number of persons riding in any cage or car at one time shall not exceed the maximum prescribed by the manufacturer. The Chief may prescribe a lesser number when necessary to ensure the safety of miners being transported.
- G. All chokers and slings used to transport materials within a shaft or slope shall meet specifications established by the United States of America Standards Institute.

45.1-161.161. Maintenance of hoisting equipment.

Hoists, ropes, cages, and other hoisting equipment shall be maintained in a safe operating condition. Hoisting ropes shall be replaced as soon as there is evidence of possible failure.

45.1-161.174. Checking system.

Each mine shall have a personnel checking system containing the following:

- 1. Every person underground shall have on his person means of positive identification bearing a number recorded by the operator;
- 2. An accurate record of the persons in the mine shall be kept on the surface in a place that will not be affected by an explosion;
- 3. The record shall consist of a written record, check board, lamp check, or time-clock record; and
- 4. The record shall bear a number identical to that carried by the person underground.

45.1-161.175. Protective clothing.

- A. All miners shall wear protective hats while underground and while in those areas on the surface where there is a danger of injury from falling objects.
- B. Every person entering an underground mine must wear reflective materials adequate to be visible from all sides. The reflective material shall be placed on hard hats and at least one other items such as belts, suspenders, jackets, coats, coveralls, shirts, pants, vests, or other item of outer clothing.
- C. Protective footwear shall be worn by miners while on duty in and around a mine where falling objects may cause injury.
- D. All employees inside or outside of mines shall wear approved-type goggles or shields where there is a hazard from flying particles.
- E. Welders and helpers shall use proper shields or goggles to protect their eyes.
- F. Miners engaged in haulage operations and miners employed around moving equipment on the surface and underground shall wear snug-fitting clothing.

- G. Gloves shall be worn when material which may injure the hands is handled. Gloves with gauntlet cuffs shall not be worn around moving equipment. Gloves shall be worn when handling energized cables.
- H. Miners exposed for short periods to hazards from inhalation of gas, dust, fumes, and mist shall wear approved respiratory equipment. When the exposure is for prolonged periods, adequate approved measures to protect miners or to reduce the hazard shall be taken.

45.1-161.176. Noise levels and ear protection.

Approved hearing protection shall be provided to miners by the mine operator. Miners shall wear approved hearing protection in areas of excess noise levels in accordance with the mine's hearing conservation program approved under 30 CFR Part 62.

45.1-161.178. Allowing persons to work in a mine with smoker's articles; penalty.

- A. No operator, agent, or mine foreman shall knowingly permit any person in an underground coal mine to smoke, carry or possess any smoker's articles or materials used for igniting smoker's articles.
- B. Any person convicted of a violation of this section shall be guilty of a Class 6 felony.

45.1-161.180. Smoking in surface and other areas.

- A. No miner or other person shall smoke, carry or possess any smoker's articles, or carry an open flame in or near any magazine for the storage of explosive materials.
- B. No miner or other person shall smoke in or around oil houses, tipples, and other surface areas where such practice may cause a fire or explosion.

45.1-161.191. Communications systems.

- A. Telephone service or equivalent two-way communication facilities shall be provided between the top and each landing of main shafts and slopes. A telephone or equivalent two-way communication facility shall be located on the surface within 500 feet of all main portals, and shall be installed either in a building or in a box-like structure designed to protect the facilities from damage by inclement weather. At least one of these communication facilities shall be at a location where an authorized person who is always on duty when miners are underground can see or hear the facility and respond immediately in the event of an emergency.
- B. Telephone lines, other than cables, shall be carried on insulators, installed on the opposite side from power or trolley wires, and where they cross power or trolley wires, they shall be insulated adequately.
- C. Lightning arrestors shall be provided at the points where telephone circuits enter the mine and at each telephone on the surface. Where the telephone circuit enters a building or structure, the lightning arrestor is only required where the circuit enters such building or structure.

- D. If a communication system other than telephones is used and its operation depends entirely upon power from the mine electric system, means shall be provided to permit continued communication in the event the mine electric power fails or is cut off.
- E. Communication systems equipped with audible and visual signals that become operative when telephone communication is being established between the phones of the communication station on the surface and the underground working sections shall be provided.
- F. The Chief shall promulgate regulations governing any disruption of communication in mines.

45.1-161.197. First aid equipment.

Each mine shall have an adequate supply of first aid equipment as determined by the Chief. Such supplies shall be located on the surface, at the bottom of shafts and slopes, and at other strategic locations near the working faces, as shall be prescribed by the Chief. The first aid supplies shall be encased in suitable sanitary receptacles designed to be reasonably dust-tight and moisture-proof. The supplies shall be available for use of all persons employed in the mine. No first aid material shall be removed or diverted without authorization except in case of injury at the mine.

45.1-161.198. Attention to injured persons.

- A. When an injury occurs underground, the injured person shall be brought promptly to the surface. Prompt medical attention shall be provided in the event of injury, and adequate facilities shall be made available for transporting injured persons to a hospital if necessary.
- B. Safe transportation shall be provided to carry an injured person from the site where the injury occurred to the surface of the mine.
- C. The operator of each mine shall post directional signs that are conspicuously located to identify the routes of ingress to and egress from any mine located off a public road.

45.1-161.201. Duties in case of fire.

- B. When a fire that may endanger persons underground cannot be extinguished immediately, the persons shall be withdrawn promptly from the mine.

45.1-161.202. Emergency response plans; list of next of kin.

- A. Operators shall develop an emergency response plan for each mine. The plan shall include (i) a fire communication plan, (ii) an evacuation procedure, (iii) the identification of waterlines, (iv) the number system of brattice, (v) the location of escapeways, and (vi) such other information relating to fire evacuation planning as the Chief may reasonably require.
- B. The operator shall maintain a list of the next of kin of all miners employed at the mine. The list shall be kept at the mine site or at a central facility readily accessible to the mine.

- C. An emergency response plan shall be subject to approval by the Chief or mine inspector.
- D. The emergency response plan shall be posted in a conspicuous manner and place, readily accessible to all miners, underground and at the surface of the mine.
- E. The operator shall train miners in the implementation of the emergency response plan and shall conduct practice drills. Records of dates and times of practice drills shall be maintained in the emergency response plan.
- F. Each miner employed by the operator who goes underground and each visitor authorized to enter the mine by the operator shall have available a self-rescue device or devices which provide one hour or longer protection and are approved by Mine Safety and Health Administration. The training related to self-rescue devices shall be included in the emergency response plan approved by the Chief.

45.1-161.203. Reporting fires; response.

In case of any unplanned fire at a mine not extinguished within thirty minutes of discovery, the operator shall report to the Chief, by the quickest available means, all information known to him. The Chief, based on the information, shall promptly go in person or dispatch a mine inspector to the scene of the fire for consultation, and assist in the extinguishing of the fire and the protection of exposed persons. In the event of a difference of opinion as to measures required, the decision of the Chief or the mine inspector shall be final. The decision of the Chief regarding measures to extinguish the fire and protect persons shall have the force of an order issued pursuant to § 45.1-161.91 if delivered to the operator in writing.

45.1-161.216. Main fans.

- F. The area surrounding main fan installations shall be kept free of combustible material for at least 100 feet in all directions where physical conditions permit.

45.1-161.236. Housekeeping; noxious fumes.

- A. Good housekeeping shall be practiced in and around buildings, shafts, slopes, yards and other areas of the mine. Such practices include cleanliness, orderly storage of materials, and the removal of possible sources of injury, such as stumbling hazards, protruding nails, broken glass and possible falling and rolling materials.
- B. Painting or operations creating noxious fumes shall be performed only in a well ventilated atmosphere.
- C. All surface mine structures, enclosures, and other facilities shall be maintained in good repair.

45.1-161.237. Lighting.

- A. Lights shall be provided as needed in or on surface structures.

- B. Roads, paths and walks outside of structures shall be kept free from obstructions and shall be well illuminated, if used at night.

45.1-161.238. Flammable or combustible material.

- A. Oil, grease, and similar flammable materials shall be kept in closed containers, separate from other materials so as not to create a fire hazard to nearby buildings or mines. If oil or grease is stored in a building, the building or room in which it is stored shall be of fireproof construction and well ventilated.
- B. Oily rags, oily waste and wastepaper shall be kept in closed metal containers until removed for disposal.
- C. The area within 100 feet of all mine openings shall be kept free of combustible material; however, this shall not apply to the temporary storage of not more than a one day's supply of such materials.
- D. All oxygen and acetylene bottles shall be stored in racks designated and constructed for the storage of such bottles with caps in place and secured when not in use. Any storage place for such materials shall be posted to prohibit smoking.

45.1-161.239. Crane operations.

A crane operator shall at all times during any hazardous crane operation maintain visual or auditory communication with all persons involved in the crane operation.

45.1-161.240. Controlling dust at surface.

- B. Surface structures and equipment shall be kept free of coal dust accumulations.

45.1-161.250. Employment and duties of top persons; plan for excavation of shaft or slope.

- A. During the construction or modification of any shaft or slope mine, the person engaged in the actual construction or modification of such mine shall employ one or more certified top persons. It shall be the duty of such top person to examine for proper and safe practices and materials used during the construction or modification of a shaft or slope mine. Such duties shall at all times be performed in the immediate vicinity of the shaft under construction.

45.1-161.265. Fire-fighting equipment; duties in case of fire; fire precautions in transportation of mining equipment; fire prevention generally.

- A. Each mine shall be provided with suitable fire-fighting equipment, adequate for the size of the mine and shall include at least three 20-pound dry chemical fire extinguishers. Equipment and devices used for the detection, warning and extinguishing of fires shall be suitable in type, size and quantity for the type of fire hazard that may be encountered. Such equipment and devices shall be strategically located and plainly identified.
- B. Suitable fire extinguishers shall be provided at all (i) electrical stations, such as substations, transformer stations and permanent pump stations, (ii) self-

propelled mobile equipment, (iii) belt heads, (iv) areas used for the storage of flammable materials, (v) fueling stations, and (vi) other areas that may constitute a fire hazard, so as to be out of the smoke in case of a fire.

45.1-161.266. Duties in case of fire.

- A. Should a fire occur, the person discovering it and any person in the vicinity of the fire shall make a prompt effort to extinguish it. When a fire that may endanger persons at the mine cannot be extinguished immediately, all persons shall be withdrawn promptly from the area of the fire.
- B. In case of any unplanned fire at or about a mine not extinguished within thirty minutes of discovery, the operator or agent shall report by the quickest available means to the Chief, giving all information known to him regarding the fire. The Chief shall take prompt action, based on the information, to go in person or dispatch qualified subordinates to the scene of the fire for consultation, and assist in the extinguishing of the fire and the protection of exposed persons. In the event of a difference of opinion as to measures required, the decision of the Chief or his designated subordinate shall be final, but must be given to the operator in writing to have the force of an order.

45.1-161.267. Fire precautions.

- B. No person shall smoke or use an open flame within twenty-five feet of locations used to handle or store flammable or combustible liquids or where an arc or flame may cause a fire or explosion.
- C. Areas surrounding flammable liquid storage tanks, electrical substations and transformers shall be kept free of combustible material for at least twenty-five feet in all directions. Such storage tanks, substations and transformers shall be posted with readily visible fire hazard warning signs.
- D. Structures or areas used for storage of flammable materials shall be constructed of fire resistant material, well ventilated, kept clean and orderly and posted with readily visible fire hazard warning signs.
- E. Fuel lines shall be equipped with shut-off valves at the sources. Such valves shall be readily accessible and maintained in good operating condition.
- F. Battery charging areas shall be well ventilated and posted with warning signs prohibiting smoking or open flames within twenty-five feet.
- G. Oil, grease, other flammable hydraulic fluid, and other flammable materials shall be kept in closed metal containers and separated from other materials so as to not create a fire hazard.
- H. Combustible materials, grease, lubricants, paints and other flammable materials and liquids shall not be allowed to accumulate where they could create a fire hazard. Provision shall be made to prevent the accumulation of such material on any equipment, at storage areas and any location where the material is used.
- I. Electric motors, switches, lighting fixtures, and controls shall be protected by dust-tight construction.
- J. Precautions shall be taken to ensure that sparks or other hot materials do not result in a fire when welding or cutting. Welding or cutting with arc or flame

- shall not be done in excessively dusty atmospheres or locations. Fire-fighting apparatus shall be readily available when welding or cutting is performed.
- K. Precautions shall be taken before applying heat, cutting or welding on any pipe or container that has contained a flammable or combustible material.
 - L. Oxygen and acetylene bottles shall be stored in racks designated and constructed for the storage of such bottles with caps in place and secured when not in use. Such bottles shall not be stored near oil, grease, and other flammable material.
 - M. Oxygen and acetylene gauges and regulators shall be kept clean and free of oil, grease, and other combustible materials.
 - N. Belt conveyors shall be equipped with control switches to automatically stop the driving motor of the conveyor in the event the belt is stopped by slipping on the driving pulley, by breakage or other accident.
 - O. Areas surrounding main fan installations and other mine openings shall be kept free from grass, weeds, underbrush and other combustible materials for twenty-five feet in all directions.
 - P. Internal combustion engines, except diesel engines, shall be shut off prior to fueling.

45.1-161.268. Haulage and mobile equipment; operating condition.

- A. All mobile equipment shall be maintained in a safe operating condition.
- B. Positive-acting stopblocks shall be used where necessary to protect persons from danger of moving or runaway haulage equipment.
- C. Where it is necessary for men to cross conveyors regularly, suitable crossing facilities shall be provided.
- D. Persons shall not get on or off moving equipment.
- E. When the equipment operator is present, persons shall notify him before getting on or off mobile equipment.
- F. Mobile equipment shall not be left unattended unless brakes are set. Mobile equipment with wheels or tracks, when parked on a grade, shall either be blocked or turned into a bank unless the lowering of the bucket or blade to the ground will prevent movement. Persons shall not work on or from a piece of mobile equipment in a raised position unless the equipment is specifically designed to lift persons.
- G. Water, debris or spilled materials which may create hazards to moving equipment shall be removed.
- H. Where seating facilities are provided on self-propelled mobile equipment, the operator shall be seated before such equipment is moved. No person shall be allowed to ride on top of self-propelled mobile equipment.
- I. Operators of self-propelled haulage equipment shall sound a warning before starting such equipment and as approaching any place where persons are or are likely to be.

45.1-161.269. Equipment operation.

- A. Equipment operating speeds, conditions and characteristics shall be prudent and consistent with conditions of roadway, grades, clearance, visibility, traffic, type and use of equipment.
- B. Vehicles shall follow at a safe distance; passing shall be limited to areas of adequate clearance and visibility.
- C. Mobile equipment shall be operated under power control at all times and mobile equipment operators shall have full control of the equipment while in motion.
- D. Before starting or moving equipment, an equipment operator must be certain by signal or other means that all persons are clear.

45.1-161.270. Safety measures on equipment.

- A. Rubber tired or crawler mounted equipment shall have rollover protective structures to the extent required by 30 CFR 77.403a.
- B. Seat belts provided in mobile equipment shall be maintained in safe working condition. Operators of such equipment shall wear seat belts when the equipment is in motion.
- C. Mobile equipment shall be equipped with adequate brakes and parking brakes.
- D. Cab windows shall be of safety design, kept in good condition and clean for adequate visibility.
- E. Tires shall be deflated before repairs on them are started and adequate means shall be provided to prevent wheel locking rims from creating a hazard during tire inflation.
- F. An audible warning device and headlights shall be provided on all self-propelled mobile equipment.
- G. An automatic backup alarm, that is audible above surrounding noise levels, shall be provided on all mobile equipment. An automatic reverse-activated strobe light may be substituted for an audible alarm when mobile equipment is operated at night.
- H. All equipment raised for repairs or other work shall be securely blocked prior to persons positioning themselves where the falling of such equipment could create a hazardous condition.

45.1-161.272. Lighting.

- A. Lights shall be provided as needed, in or on surface structures.
- B. Roads, paths and walks outside of surface structures shall be kept free from obstructions and shall be well illuminated if used at night.

45.1-161.273. Shop and other equipment.

- A. The following shall be guarded and maintained adequately:
 - 1. Gears, sprockets, pulleys, fan blades or propellers, friction devices and couplings with protruding bolts or nuts.
 - 2. Shafting and projecting shaft ends that are within seven feet of floor or platform level.
 - 3. Belt, chain or rope drives that are within seven feet of floor or platform.

4. Fly wheels. Where fly wheels extend more than seven feet above the floor, they shall be guarded to a height of at least seven feet.
 5. Circular and band saws and planers.
 6. Repair pits. Guards shall be kept in place when the pits are not in use.
 7. Counterweights.
 8. Mine fans. The approach shall be guarded.
 9. Lighting and other electrical equipment that may cause shock hazards or personal injury.
- B. Machinery shall not be repaired or oiled while in motion; provided, however, that this shall not apply where safe remote oiling devices are used.
- C. A guard or safety device removed from any machine shall be replaced before the machine is put in operation.
- D. Mechanically operated grinding wheels shall be equipped with:
1. Safety washers and tool rests.
 2. Substantial retaining hoods, the hood opening of which shall not expose more than a 90 degree sector of the wheel. Such hoods shall include a device to control and collect excess rock, metal or dust particles, or equivalent protection shall be provided to the employees operating such machinery.
 3. Eyeshields, unless goggles are worn by the operators.

45.1-161.275. Stairways, platforms, runways and floor openings.

- A. Stairways, platforms, and runways shall be provided where men work or travel.
- B. Stairways, elevated platforms, floor openings and elevated runways shall be equipped with suitable handrails or guardrails.
- C. Elevated platforms, floor openings, stairways and runways shall be provided with toe boards. Platforms, stairways and runways shall be kept clear of stumbling and slipping hazards and maintained in good repair.

45.1-161.277. Equipment operation.

- B. Dippers, buckets, scraper blades and similar movable parts shall be secured or lowered to the ground when not in use.
- C. Equipment which is to be hauled shall be loaded and protected so as to prevent sliding or spillage. When moving between work areas the equipment shall be secured in the travel position.
- F. Dippers, buckets, loading booms or other heavy loads shall not be swung over cabs of haulage equipment until the driver is out of the cab and is in a safe location unless the equipment is designed specifically to protect drivers from falling material.

45.1-161.279. Overhead high-potential power lines; surface transmission lines; electric wiring in surface buildings.

- A. Overhead high-potential power lines shall be placed at least fifteen feet above the ground and twenty feet above driveways and haulage roads, shall be installed on insulators, and shall be supported and guarded to prevent contact with other circuits.

45.1-161.282. Circuit breakers and switches.

- B. Operating controls, such as switches, starters, and switch buttons, shall be so installed that they are readily accessible and can be operated without danger of contact with moving or live parts.
- D. Insulating mats or other electrically nonconductive material shall be kept in place at each power-control switch and at stationary machinery where shock hazards exist.
- E. Suitable danger signs shall be posted conspicuously at all high-voltage installations.
- G. Power circuits shall be labeled to indicate the unit or circuit they control.
- H. Persons shall stay clear of an electrically powered shovel or other similar heavy equipment during an electrical storm.

45.1-161.284. Surface storage of explosives and detonators. (Note: A thru I same as 45.1-161.126)

- J. Smoking, carrying smokers' articles or open flames shall be prohibited in or near any magazine.

SECTION 2 CODE OF FEDERAL REGULATIONS – TITLE 30

Subpart B--Qualified and Certified Person

77.100 Certified persons.

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

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

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

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

(2) If this person has been certified for such purpose by the Secretary. A person's initial certification is valid for as long as the person continues to satisfy the requirements necessary to obtain the certification and is employed at the same coal mine or by the same independent contractor. The mine operator or independent contractor shall make an application which satisfactorily shows that each such person has had at least 2 years experience at a coal mine or equivalent experience, and that each such person demonstrates to the satisfaction of an authorized representative of the Secretary that such person is able and competent to test for oxygen deficiency with a permissible flame safety lamp, or any other device approved by the Secretary and to test for methane with a portable methane detector approved by the Bureau of Mines, MESA, or MSHA, under Part [22](#) of this Chapter (Bureau of Mines Schedule 8C), and to perform such other duties for which application for certification is made. Applications for certification by the Secretary should be submitted in writing to the Mine Safety and Health Administration, Certification and Qualification Center, P.O. Box 25367, Denver Federal Center, Denver, Colorado 80225.

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

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

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

- (1) If he has been qualified for this purpose by the State in which the coal mine is located; or
 - (2) If he has been qualified by the Secretary for these purposes upon a satisfactory showing by the operator of the coal mine that each such person has been trained and designated by the operator to test for methane and oxygen deficiency.
- Applications for Secretarial qualification should be submitted in writing to the Mine Safety and Health Administration, Certification and Qualification Center, P.O. Box 25367, Denver Federal Center, Denver, Colo. 80225

77.102 Tests for methane; oxygen deficiency; qualified persons, additional requirement.

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

77.103 Electrical work; qualified person.

- (a) Except as provided in paragraph (f) of this section, an individual is a qualified person within the meaning of Subparts F, G, H, I, and J of this Part [77](#) to perform electrical work (other than work on energized surface high-voltage lines) if:
- (1) He has been qualified as a coal mine electrician by a State that has a coal mine electrical qualification program approved by the Secretary; or,
 - (2) He has at least 1 year of experience in performing electrical work underground in a coal mine, in the surface work areas of an underground coal mine, in a surface coal mine, in a noncoal mine, in the mine equipment manufacturing industry, or in any other industry using or manufacturing similar equipment, and has satisfactorily completed a coal mine electrical training program approved by the Secretary; or,
 - (3) He has at least 1 year of experience, prior to the date of the application required by paragraph (c) of this section, in performing electrical work underground in a coal mine, in the surface work areas of an underground coal mine, in a surface coal mine, in a noncoal mine, in the mine equipment manufacturing industry, or in any other industry using or manufacturing similar equipment, and he attains a satisfactory grade on each of the series of five written tests approved by the Secretary as prescribed in paragraph (b) of this section.
- (b) The series of five written tests approved by the Secretary shall include the following categories:
- (1) Direct current theory and application;
 - (2) Alternating current theory and application;
 - (3) Electric equipment and circuits;
 - (4) Permissibility of electric equipment; and,
 - (5) Requirements of Subparts F through J and S of this Part [77](#).
- (c) In order to take the series of five written tests approved by the Secretary, an individual shall apply to the District Manager and shall certify that he meets the

requirements of paragraph (a)(3) of this section. The tests will be administered in the Coal Mine Safety and Health Districts at regular intervals, or as demand requires.

(d) A score of at least 80 percent on each of the five written tests will be deemed to be a satisfactory grade. Recognition shall be given to practical experience in that 1 percentage point shall be added to an individual's score in each test for each additional year of experience beyond the 1 year requirement specified in paragraph (a)(3) of this section; however, in no case shall an individual be given more than 5 percentage points for such practical experience.

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

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

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

77.105 Qualified hoistman slope or shaft sinking operation; qualifications.

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

(2) If a State has no program for qualifying persons as hoistmen, the Secretary may qualify persons if the operator of the slope or shaft-sinking operation makes an application and a satisfactory showing that the person has had 1 year of experience operating hoists. A person's qualification is valid for as long as the person continues to satisfy the requirements for qualification and is employed at the same coal mine or by the same independent contractor.

(b) Applications for Secretarial qualification should be submitted to the Mine Safety and Health Administration, Certification and Qualification Center, P.O. Box 25367, Denver Federal Center, Denver, Colo. 80225.

77.106 Records of certified and qualified persons.

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

77.107 Training Programs.

Each operator must submit to the district manager, of the Coal Mine Safety and Health District in which the mine is located, a program or plan setting forth what, when, how, and where the operator will train and retrain persons whose work

assignments require that they be certified or qualified. The program must provide:

- (a) For certified persons, annual training courses in the tasks and duties which they perform as certified persons, first aid, and the provisions of this part 77; and
- (b) For qualified persons, annual courses in performance of the tasks which they perform as qualified persons.

Subpart C--Surface Installations

77.200 Surface installations; general.

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

77.201 Methane content in surface installations

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

77.201-2 Methane accumulations; change in ventilation.

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

77.202 Dust accumulations in surface installations.

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

77.203 Use of material or equipment overhead; safeguards.

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

77.204 Openings in surface installations; safeguards.

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

77.205 Travelways at surface installations.

- (a) Safe means of access shall be provided and maintained to all working places.
- (b) Travelways and platforms or other means of access to areas where persons are required to travel or work, shall be kept clear of all extraneous material and other stumbling or slipping hazards.
- (c) Inclined travelways shall be constructed of nonskid material or equipped with cleats.
- (d) Regularly used travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.

(e) Crossovers, elevated walkways, elevated ramps, and stairways shall be of substantial construction, provided with handrails, and maintained in good condition. Where necessary toeboards shall be provided.

(f) Crossovers shall be provided where it is necessary to cross conveyors.

(g) Moving conveyors shall be crossed only at designated crossover points

77.206 Ladders; construction; installation and maintenance.

(a) Ladders shall be of substantial construction and maintained in good condition.

(b) Wooden members of ladders shall not be painted.

(c) Steep or vertical ladders which are used regularly at fixed locations shall be anchored securely and provided with backguards extending from a point not more than 7 feet from the bottom of the ladder to the top of the ladder.

(d) Fixed ladders shall not incline backwards at any point unless provided with backguards.

(e) Fixed ladders shall be anchored securely and installed to provide at least 3 inches of toe clearance.

(f) Fixed ladders shall project at least 3 feet above landings, or substantial handholds shall be provided above the landings.

77.207 Illumination.

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

77.208 Storage of materials.

(a) Materials shall be stored and stacked in a manner which minimizes stumbling or fall-of-material hazards.

(b) Materials that can create hazards if accidentally liberated from their containers shall be stored in a manner that minimizes the dangers.

(c) Containers holding hazardous materials must be of a type approved for such use by recognized agencies.

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

(e) Valves on compressed gas cylinders shall be protected by covers when being transported or stored, and by a safe location when the cylinders are in use.

77.210 Hoisting of materials.

(a) Hitches and slings used to hoist materials shall be suitable for handling the type of materials being hoisted.

(b) Men shall stay clear of hoisted loads.

(c) Taglines shall be attached to hoisted materials that require steadying or guidance.

Subpart L – Fire Protection

77.1100 Fire protection; training and organization.

Firefighting facilities and equipment shall be provided commensurate with the potential fire hazards at each structure, enclosure and other facility (including custom coal preparation) at the mine and the employees at such facilities shall be instructed and trained annually in the use of such firefighting facilities and equipment.

77.1101 Escape and evacuation; plan.

- (a) Before September 30, 1971, each operator of a mine shall establish and keep current a specific escape and evacuation plan to be followed in the event of a fire.
- (b) All employees shall be instructed on current escape and evacuation plans, fire alarm signals, and applicable procedures to be followed in case of fire.
- (c) Plans for escape and evacuation shall include the designation and proper maintenance of adequate means for exit from all areas where persons are required to work or travel including buildings and equipment and in areas where persons normally congregate during the work shift.

77.1102 Warning signs; smoking and open flame.

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

77.1103 Flammable liquids; storage.

Flammable liquids shall be stored in accordance with standards of the National Fire Protection Association. Small quantities of flammable liquids drawn from storage shall be kept in properly identified safety cans.

77.1104 Accumulations of combustible materials.

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

77.1106 Battery-charging stations; ventilation.

Battery-charging stations shall be located in well-ventilated areas. Battery-charging stations shall be equipped with reverse current protection where such stations are connected directly to direct current power systems.

77.1109 Quantity and location of firefighting equipment.

Preparation plants, dryer plants, tipples, drawoff tunnels, shops, and other surface installations shall be equipped with the following firefighting equipment.

- (a) Each structure presenting a fire hazard shall be provided with portable fire extinguishers commensurate with the potential fire hazard at the structure in accordance with the recommendations of the National Fire Protection Association.

- (b)(1) Mobile equipment, including trucks, front-end loaders, bulldozers, portable welding units, and augers, shall be equipped with at least one portable fire extinguisher.
- (2) Power shovels, draglines, and other large equipment shall be equipped with at least one portable fire extinguisher; however, additional fire extinguishers may be required by an authorized representative of the Secretary.
- (3) Auxiliary equipment such as portable drills, sweepers, and scrapers, when operated more than 600 feet from equipment required to have portable fire extinguishers, shall be equipped with at least one fire extinguisher.
- (c) Fire extinguishers shall be provided at permanent electrical installations commensurate with the potential fire hazard at such installation in accordance with the recommendations of the National Fire Protection Association.
- (d) Two portable fire extinguishers, or the equivalent, shall be provided at each of the following combustible liquid storage installations:
 - (1) Near each above ground or unburied combustible liquid storage station; and,
 - (2) Near the transfer pump of each buried combustible liquid storage tank.
- (e) Vehicles transporting explosives and blasting agents shall be equipped with fire protection as recommended in Code 495, section 20, National Fire Protection Association Handbook, 12th Edition, 1962.

77.1110 Examination and maintenance of firefighting equipment.

Firefighting equipment shall be continuously maintained in a usable and operative condition. Fire extinguishers shall be examined at least once every 6 months and the date of such examination shall be recorded on a permanent tag attached to the extinguisher.

77.1111 Welding, cutting, soldering; use of fire extinguisher.

One portable fire extinguisher shall be provided at each location where welding, cutting, or soldering with arc or flame is performed.

77.1112 Welding, cutting, or soldering with arc or flame; safeguards.

- (a) When welding, cutting, or soldering with arc or flame near combustible materials, suitable precautions shall be taken to insure that smoldering metal or sparks do not result in a fire.
- (b) Before welding, cutting, or soldering is performed in areas likely to contain methane, an examination for methane shall be made by a qualified person with a device approved by the Secretary for detecting methane. Examinations for methane shall be made immediately before and periodically during welding, cutting, or soldering and such work shall not be permitted to commence or continue in air which contains 1.0 volume per centum or more of methane.

Subpart R - Miscellaneous

77.1702 Arrangements for emergency medical assistance and transportation for injured persons; reporting requirements; posting requirements.

(a) Each operator of a surface coal mine shall make arrangements with a licensed physician, medical service, medical clinic, or hospital to provide 24-hour emergency medical assistance for any person injured at the mine.

(b) Each operator shall make arrangements with an ambulance service, or otherwise provide for 24-hour emergency transportation for any person injured at the mine.

(c) Each operator shall, on or before September 30, 1971, report to the Coal Mine Health and Safety District Manager for the district in which the mine is located the name, title and address of the physician, medical service, medical clinic, hospital, or ambulance service with whom arrangements have been made, or otherwise provided, in accordance with the provisions of paragraphs (a) and (b) of this section.

(d) Each operator shall, within 10 days after any change of the arrangements required to be reported under the provisions of this section, report such changes to the Coal Mine Health and Safety District Manager. If such changes involve a substitution of persons, the operator shall provide the name, title, and address of the person substituted together with the name and address of the medical service, medical clinic, hospital, or ambulance service with which such person or persons are associated.

(e) Each operator shall, immediately after making an arrangement required under the provisions of paragraphs (a) and (b) of this section, or immediately after any change, of such agreement, post at appropriate places at the mine the names, titles, addresses, and telephone numbers of all persons or services currently available under such arrangements to provide medical assistance and transportation at the mine.

77.1713 (a), (b), (c), (d) Daily inspection of surface coal mine; certified person; reports of inspection.

(a) At least once during each working shift, or more often if necessary for safety, each active working area and each active surface installation shall be examined by a certified person designated by the operator to conduct such examinations for hazardous conditions and any hazardous conditions noted during such examinations shall be reported to the operator and shall be corrected by the operator.

(b) If any hazardous condition noted during an examination conducted in accordance with paragraph (a) of this section creates an imminent danger, the person conducting such examination shall notify the operator and the operator shall withdraw all persons from the area affected, except those persons referred to in section 104(d) of the Act, until the danger is abated.

(c) After each examination conducted in accordance with the provisions of paragraph (a) of this section, each certified person who conducted all or any part of the examination required shall enter with ink or indelible pencil in a book approved by the Secretary the date and a report of the condition of the mine or any area of the mine which he has inspected together with a report of the nature and location of any hazardous condition found to be present at the mine. The book

in which such entries are made shall be kept in an area at the mine designated by the operator to minimize the danger of destruction by fire or other hazard.

(d) All examination reports recorded in accordance with the provisions of paragraph (c) of this section shall include a report of the action taken to abate hazardous conditions and shall be signed or countersigned each day by at least one of the following persons:

- (1) The surface mine foreman;
- (2) The assistant superintendent of the mine;
- (3) The superintendent of the mine; or,
- (4) The person designated by the operator as responsible for health and safety at the mine.

77.1903 Hoists and hoisting; minimum requirements.

- (a) Hoists used in transporting persons and material during drilling, mucking, or other excavating operations in any slope or shaft shall have rated capacities consistent with the loads to be handled.
- (b) Each hoist used in drilling, mucking, or other excavating operations shall be equipped with an accurate and reliable indicator of the position of the cage, platform, or bucket. This indicator shall be installed in clear view of the hoist operator.

77.1904 Communications between slope and shaft bottoms and hoist operations.

- (a) Two independent means of signaling shall be provided between the hoistman and all points in a slope or shaft where men are required to work. At least one of these means shall be audible to the hoistman. Signal codes used in any communication system shall be posted conspicuously at each slope and shaft.
- (b) Signaling systems used for communication between slopes and shafts and the hoistman shall be tested daily.

77.1905 Hoist safeguards; general.

- (a) Hoists used to transport persons shall be equipped with brakes capable of stopping and holding the cage, bucket, platform, or other device when fully loaded.
- (b) When persons are transported by a hoist, a second person familiar with and qualified to stop the hoist shall be in attendance, except where the hoist is fully equipped with overspeed, overwind, and automatic stop devices.

77.1906 Hoists; daily inspection.

- (a) Hoists used to transport persons shall be inspected daily. The inspection shall include examination of the headgear (headframe, sheave wheels, etc.), connections, links and chains, and other facilities.
- (b) Prior to each working shift, and before a hoist is returned to service after it has been out of normal service for any reason, the hoist shall be run by the hoist operator through one complete cycle of operation before any person is permitted to be transported.

- (c) At the completion of each daily examination required by paragraph (a) of this section, the person making the examination shall certify, by signature and date, that the examination has been made. If any unsafe condition in the hoisting equipment is present, the person conducting the examination shall make a record of the condition and the date. Certifications and records shall be retained for one year.

77.1907 Hoist construction; general.

If hooks are used to attach cages or buckets to the socket or thimble of a hoisting rope, the hooks shall be self-closing.

77.1908 Hoist installations; use.

- (a) Where men are transported by means of a hoist and the depth of the shaft exceeds 50 feet, the hoist rope shall be suspended from a substantial hoisting installation which shall be high enough to provide working clearance between the bottom of the sheave and the top of the cage or bucket.
- (b) Where men are transported by means of a hoist and the depth of the shaft exceeds 100 feet, temporary shaft guides and guide attachments, or other no less effective means, shall be installed to prevent the cage, platform, or bucket from swinging.
- (c) All guides and guide attachments, or other no less effective means, installed in accordance with paragraph (b) of this section shall be maintained to a depth of not less than 75 feet from the bottom of the shaft.
- (d) Where crossheads are used, the cage, platform, or bucket shall not be hung more than 10 feet below the crosshead.
- (e) Where men are required to embark or disembark from a cage, platform or bucket suspended over or within a shaft, a loading platform shall be installed to insure safe footing.
- (f) During the development of each slope or shaft, either a ladder or independently powered auxiliary hoist shall be provided to permit men to escape quickly in the event of an emergency.
- (g) No person shall be permitted to ride the rim of any bucket or on the top of a loaded bucket.
- (h) The number of persons permitted to ride in cages, skips, or buckets shall be limited so as to prevent overcrowding.
- (i) Persons shall not be permitted to ride on a cage, skip, or bucket with tools or materials, except when necessary to handle equipment while in transit. Materials shall be secured to prevent shifting while being hoisted.
- (j) The speed of buckets transporting persons shall not exceed 500 feet per minute and not more than 200 feet per minute when within 100 feet of any stop.
- (k) A notice of established speeds shall be posted in clear view of the hoistman.
- (l) Conveyances being lowered in a shaft in which men are working shall be stopped at least 15 feet above such men and shall be lowered further only after the hoistman has received a signal that all men who may be endangered by the conveyance are in the clear.

- (m) No skip or bucket shall be raised or lowered in a slope or shaft until it has been trimmed to prevent material from falling back down the slope or shaft.
- (n) Measures shall be taken to prevent material from falling back into the shaft while buckets or other conveyances are being unloaded.
- (o) Properly attached safety belts shall be worn by all persons required to work in or over any shaft where there is a drop of 10 or more feet, unless other acceptable means are provided to prevent such persons from falling into the shaft.

77.1908-1 Hoist operations; qualified hoistman.

Hoists shall be under the control of and operated by a qualified hoistman when men are in a slope or shaft.

77.1915 Storage and handling of combustible material.

- (a) Compressed and liquefied gas, oil, gasoline, and other petroleum products shall not be stored within 100 feet of any slope or shaft opening.
- (b) Other combustible material and supplies shall not be stored within 25 feet of any slope or shaft opening.
- (e) Oily rags, waste, waste paper, and other combustible waste material disposed of in the vicinity of any slope or shaft opening shall be stored in closed containers until removed from the area.

Section 3

Additional Safety Requirements

- I. Explosive and detonator magazines.**
 - A. Detonators shall not be stored in the same magazine with explosives.
 - B. Magazines for explosives and/or detonators shall be detached structures located away from powerlines, fuel storage and other possible sources of fire.
 - C. Detonator storage magazines shall be separated at least twenty-five feet from explosive storage magazines.
 - D. Cases or boxes containing explosives shall not be stored in magazines on their ends or sides nor stacked more than six feet high.

- II. Vehicles used to transport explosives or detonators.**
 - A. Vehicles used to transport explosives other than blasting agents shall have substantially constructed bodies, no sparking metal exposed in the cargo space and shall be equipped with suitable sides and tail gates and explosives shall not be piled higher than the side or end.
 - B. Vehicles containing explosives or detonators shall be maintained in good condition and shall be operated at safe speed and in accordance with safe operating practices.
 - C. Vehicles containing explosives or detonators shall be posted with proper warning signs.
 - D. These vehicles shall not transport materials or supplies in the cargo compartment except for secured nonsparking equipment used expressly in the handling of such explosives.

- III. Transportation of explosives and detonators.**
 - A. Explosives and detonators shall be transported in separate vehicles unless separated by four inches of hardwood or the equivalent.
 - B. Explosives and detonators shall be transported promptly without undue delay in transit.
 - C. Explosives and detonators shall be transported at times and over routes that expose a minimum number of people.
 - D. Only the necessary attendants shall ride on or in vehicles containing explosives and detonators.
 - E. Vehicles shall be attended while loaded with explosives and/or detonators.
 - F. Parked vehicles containing explosives shall have the brakes set, the motor shut off and wheels blocked securely against rolling.
 - G. Vehicles containing explosives or detonators shall not be taken to a repair garage or shop for any purpose.

- IV. Handling and use of explosives.**
 - A. Explosives and detonators should be kept apart until the very last moment before use.
 - B. They should always be handled carefully, kept dry and protected from shock, friction, fire or sparks.

- C. Wires of electric detonators should be kept from contacting stray electric currents or electrically charged surfaces.
 - D. All explosives and detonators unused at the end of each day should be returned to proper storage.
- V. **4 VAC 25-70-10. Regulations governing disruption of communications in mines; general requirements.**
- A. Section 45.1-161.191 of the Code of Virginia requires that telephone service or an equivalent two-way communication system be provided between the top and each landing of main shafts and slopes in the mines.
 - B. Corrective actions shall be taken when a disruption or failure of the required communication system occurs to any section or part of an underground mine where preparation for mining is being made or mining is in progress. Work to restore communications shall begin immediately.
 - C. Any disruption in communication which is not restored within one hour shall be recorded by the mine foreman in the on-shift report. The record shall reflect the corrective actions taken and time the communication was restored.
 - D. Whenever a representative of the miners, or a miner where there is no such representative, has reason to believe that conditions are such that continuing to work on a section without communication would constitute an imminent danger to safety or health, such miner or representative shall notify the Chief of the Division of Miners or mine inspector of his concern. Upon receipt of such notification, the Chief shall cause an inspection to be made as soon as possible. If the inspection determines that such danger exists, the workers, excluding those needed to correct the problem, shall be withdrawn to a place that has communication with the surface.

SECTION 4

SAMPLE QUESTIONS

(a. = answer)

1. When excavations of a shaft or slope are too shallow to retain the blasted material, the blasting area shall be:
 - a. Covered with mats or other materials that will contain the blasted material.
2. The methane content in the air of any structure, enclosure or other facility shall be:
 - a. Less than 1.0 volume per centum.
3. What type signs shall be posted where fire or explosion hazards exist?
 - a. Signs warning against smoking or open flames
4. Until he is certified, no person shall perform any task requiring certification from:
 - a. The Board of Coal Mining Examiners
5. Explosives and detonators shall be stored on the surface:
 - a. In separate magazines
6. What must be provided between the top and each landing of main shafts and slopes in the mines?
 - a. Telephone service or an equivalent two-way communications system
7. Who is allowed to perform electrical work at surface installations?
 - a. A certified electrical repairman who is certified for the surface or underground.
8. What kind of sign shall be posted at all transformer stations?
 - a. Suitable danger signs.
9. Before working on a power circuit or electric equipment, who must de-energize, lock out and tag the circuit?
 - a. Persons exposed to the risk should the circuit or equipment be energized.
10. Who is allowed to operate machinery and equipment?
 - a. An authorized person who is task trained.
11. Persons shall not work on or from a piece of mobile equipment in a raised position unless:
 - a. The equipment is specifically designed to lift persons
12. Adequate guards shall be maintained on:
 - a. Gears, sprockets, and pulleys; shafting and projecting shaft ends that are within seven feet of the floor; and circular and band saws.

13. Combustible materials, such as grease, paints or other flammable liquids shall not be allowed to:
 - a. Accumulate where they will create a fire hazard
14. Steps, landings, platforms and walkways should be kept free of:
 - a. Oil, grease and ice.
15. When and where shall lights be provided for surface structures and areas outside surface structures?
 - a. Lights shall be provided as needed and for roads, paths and walks if used at night.
16. Cages used for hoisting men shall have:
 - a. Enclosed sides, adequate steel bonnets and substantial construction
17. The floor of cages shall be designed and constructed to:
 - a. Be impossible for miners feet or body to enter any opening in the bottom of the cage and carry the load
18. A test of safety catches on cages shall be made:
 - a. Monthly
19. Hoisting machinery shall be maintained in:
 - a. Safe operating condition
20. Platforms or work decks used for transporting miners or materials shall be equipped with:
 - a. Leveling indicators
21. Hoisting ropes shall be fastened to their load by:
 - a. A spelter filled socket or thimble with an adequate number of clamps
22. An indicator showing the position of the cage shall be in clear view of the hoisting engineer unless:
 - a. The position of the car or trip is clearly visible to the hoisting engineer or other person operating the equipment at all times
23. What must be done before hoisting or lowering men when the cage has been idle for more than one hour?
 - a. Empty cages must be operated up and down the shaft one complete trip
24. Any rope attached to a cage, man car or trip used for hoisting or lowering men or materials shall be provided with:
 - a. Two bridle chains or cables

25. Platforms or work decks shall be maintained in reasonably level position while:
 - a. Transporting men and materials
26. Defects found during daily hoist inspections shall be:
 - a. Reported to the mine operator or agent and corrected promptly
27. The purpose of the safety dogs is to:
 - a. Clamp down on the shaft guide if the rope slips or fails
28. All self-dumping cages used to transport personnel shall be equipped with:
 - a. Locking devices to prevent tilting of the cage
29. Signaling codes shall be in use at each shaft mine and approved by:
 - a. The Chief, Division of Mines
30. What shall not be permitted to accumulate excessively on the walls of any shaft where men are hoisted or lowered?
 - a. Ice
31. One of the methods of communications between shaft station and hoist room shall be a signal which can be heard at all times by the:
 - a. Hoisting Engineer
32. All suspended work decks and platforms shall be equipped with:
 - a. Safety belts and guardrails
33. Who can ride a cage loaded with supplies?
 - a. Not any one
34. How is the number of persons that can ride in any cage at one time determined?
 - a. The number of persons riding the cage shall not exceed the maximum number prescribed by the manufacturer
35. The safety gate is:
 - a. A guard across a landing of the shaft
36. At a shaft mine the “collar” is referred to as:
 - a. The area surrounding the shaft opening
37. The hoist must be taken out of service
 - a. When there is evidence of damage or failure of hoist parts
38. A daily visual examination of hoisting equipment should include the following:
 - a. Headgears, cages, ropes, connections, links, chains, shaft guides, shaft walls, bull gears, lighting systems and head frame

39. The depth indicator for the shaft shows what?
 - a. The position of the cage or trip at any point in the shaft
40. When is a person that is certified as a top person required to be on duty?
 - a. While any person is underground during shaft and/or slope sinking

References

Coal Mine Safety Laws of Virginia; Commonwealth of Virginia; Department of Mines, Minerals and Energy; 2005 Edition

Code of Federal Regulations; Title 30, Part 77; Office of Federal Register National Archives and Records Administration; 2006 Edition

Hoisting Engineer Certification Study Guide; Commonwealth of Virginia; Department of Mines, Minerals and Energy; 2007 Edition

Safety and Health Regulations for Coal Mines; Commonwealth of Virginia; Department of Mines, Minerals and Energy; 2004 Edition