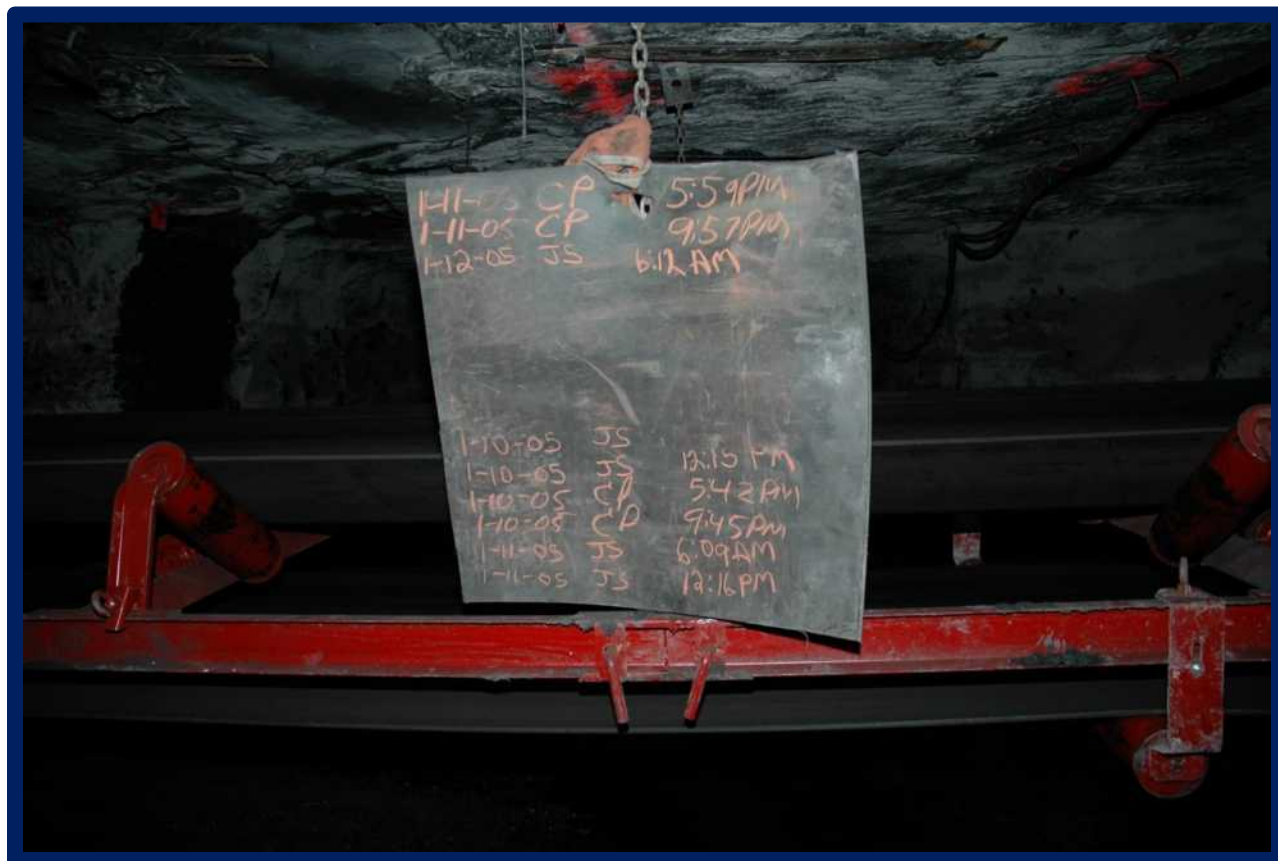


West Virginia Office of Miners' Health, Safety and Training

Belt Examiners Study Guide



Revised October 2019

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Being a belt examiner carries a huge responsibility! Not only are you making it safe for others but you have to remain safe while you are doing it. SAFETY FIRST!

CERTIFICATION STANDARDS FOR UNDERGROUND BELT EXAMINERS

CRITERIA REQUIRED TO TEST FOR UNDERGROUND BELT EXAMINER

- ✓ Must present a valid West Virginia underground miners certificate
- ✓ Must have a minimum of two (2) years practical underground experience
- ✓ Must present proper photo ID
- ✓ Must complete an OFFICIAL BELT EXAMINER EXPERIENCE DOCUMENT
- ✓ The examination fee is \$10.00

REQUIRED EXAMINATION COMPONENTS

Written

- Belt conveyor legal requirements
- Roof control practices
- Mine ventilation, including ventilating a map
- Mine gases and instruments
- Fire hazards
- Inspection and reporting procedures

Practical

- Anemometer
- Multi-gas detector

EXAMINATION PASSAGE CRITERIA

A score of 75% or greater on the written part and the passage of the practical parts are required to pass the examination in order to receive the Belt Examiner certification.

Any person who fails the written or the practical part shall be required to retake and pass the entire examination in order to receive a certificate.

Attach recent photograph

DO NOT WRITE IN THIS SPACE REVISED 9/2019



Belt Examiner Number: _____

Date Issued: _____

State of West Virginia
Office of Miners' Health, Safety and Training
7 Players Club Drive - Suite 2
Charleston, WV 25311-1626
Web: minesafety.wv.gov

OFFICIAL BELT EXAMINER EXPERIENCE DOCUMENT

Section 1

Name (Print) _____
Last First Middle

Address _____
Street or Box City State Zip

SSN (last four digits): _____ WV Miners Certificate No. _____

Total years mining experience: _____ years (Minimum of two (2) years underground experience required)

Present Occupation: _____

Section 2 Mining Experience: Minimum of two (2) years underground experience required

Company Name	Mine Name	Company Address	Duties	Years and Months Worked	Sheet Number
				Years _____ Months _____	

(Use additional sheets as necessary to document experience.)

NOTARIZED

SECTION 3

Subscribed and sworn before me, a Notary Public in and for _____ County, State of

_____ on this _____ day of _____ 20 ____.

Notary Public

My commission Expires _____

(Notary Seal)

I HEREBY CERTIFY THAT THE ABOVE STATEMENTS ARE TRUE AND CORRECT,

Date

Signature of Company Official

22A-1-21(d): Whoever knowingly makes any false statements, representation, or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to this law or any order or decision issued under this shall be guilty of a misdemeanor, and upon conviction thereof, shall be fined not more than \$5,000.00 or imprisoned in the county jail not more than 6 months, or both fined and imprisoned.

Date

Signature of Applicant

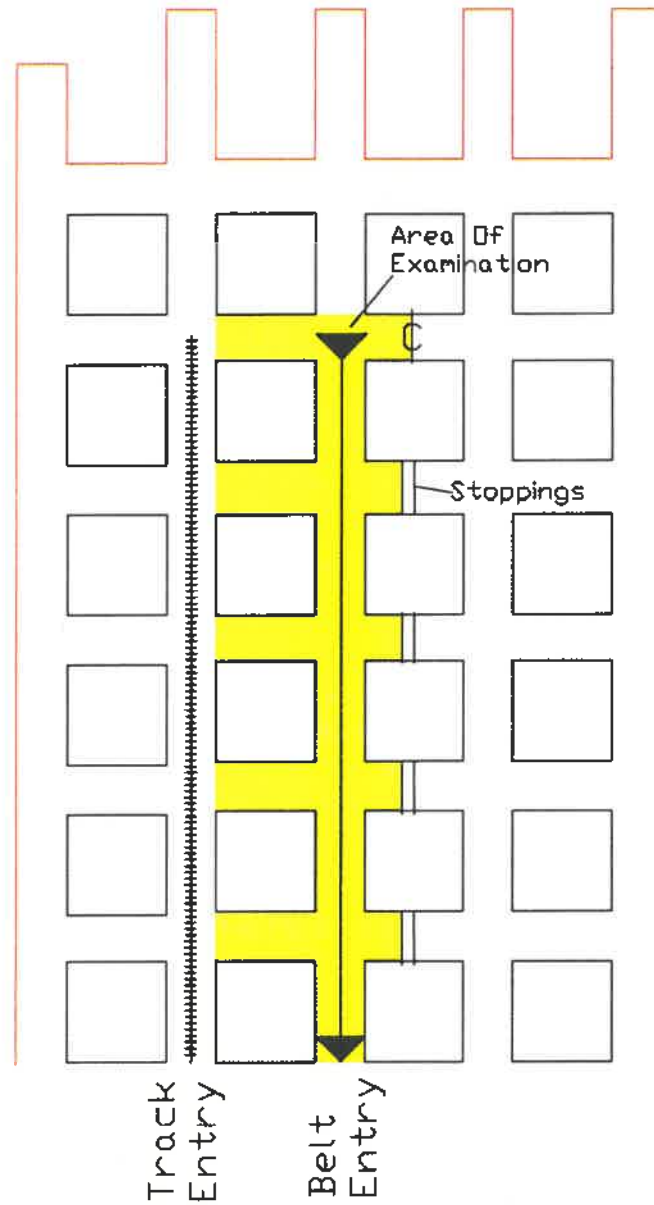
Approval Date

Approved by (WVMHST)

NOTE: Applicant must have miner certification card, photo ID and current proof of First Aid training

Belt Examiner's Area Of Responsibility

#1E #2E #3E #4E #5E



TERMS and DEFINITIONS

Abandoned Workings: The term 'Abandoned Workings' means excavation, either caved or sealed, that are deserted and in which further mining is not intended, or open workings which are ventilated and not inspected regularly.

Accident: The term "Accident" means:

- (1) A death of an individual at a mine;
- (2) An injury to an individual at a mine which has a reasonable potential to cause death;
- (3) An unplanned inundation of a mine by a liquid or gas;
- (4) An unplanned ignition or explosion of gas or dust;
- (5) An unplanned ignition or explosion of a blasting agent or an explosive;
- (6) An unplanned fire in or about a mine not extinguished within five minutes of ignition;
- (7) An unplanned roof fall at or above the anchorage zone in active workings where roof bolts are in use; or an unplanned roof or rib fall in active workings that impairs ventilation or impedes passage;
- (8) A coal or rock outburst that causes withdrawal of miners or which disrupts regular mining activity for more than one (1) hour;
- (9) An unstable condition at an impoundment, refuse pile, or culm bank which requires emergency action in order to prevent failure, or which cause individuals to evacuate an area; or, failure of an impoundment, refuse pile, or culm bank;
- (10) Damage to hoisting equipment in a shaft or slope which endangers an individual or which interferes with use of the equipment of more than (30) minutes;
- (11) An event at a mine which causes death or bodily injury to an individual not at the mine at the time the event occurs.

Active workings: The term "Active Workings" means all places in a mine that are ventilated and inspected regularly.

Afterdamp: The term “Afterdamp” means the mixture of gases which remain in a mine after a mine fire or an explosion which may contain irrespirable gases.

Agent: The term ‘Agent’ means any person charged with the responsibility for the operations of all or a part of a underground mine, or the supervision of the miners in a underground mine.

Assistant Mine Foreman: The term ‘Assistant Mine Foreman’ shall mean the certified person designated to assist the mine foreman in the supervision of a portion or the whole of a mine, and/ or of the persons employed therein.

Barricaded: The term ‘Barricaded’ means to obstruct passage of person, vehicles, or flying materials.

Blackdamp: The term ‘Blackdamp’ means a mine atmosphere deficient in oxygen incapable of supporting life. Blackdamp is heavier than air and lies along the floor.

Brake Systems: The term “Brake System” means:

- (A) Service brake system - the primary brake system used for stopping a vehicle.
- (B) Emergency stopping system - the system used for stopping a vehicle in the event of any single failure in the service brake system.
- (C) Parking system - a system to hold a stopped vehicle in a stationary position.

Bump: The term “Bump” means the bursting of coal by excessive pressure on the mine roof and ribs.

Certified Electrician: The term ‘Certified Electrician’ shall mean any person who is qualified as a mine electrician and who has passed an examination given by the Office of Miners’ Health, Safety and Training, or has at least three (3) years of experience in performing electrical work underground in a coal mine, in the surface work area of an underground coal mine, in a surface coal mine, in a non-coal 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 Office of Miners’ Health, Safety and Training.

Certified Person: The term ‘Certified Person’ when used to designate the kind of person to whom the performance of a duty in connection with the operation of a mine shall be assigned, shall mean a person who is qualified under the provisions of the law to perform such duty.

Check-in check-out system: The term ‘Check-in Check-out System’ means a system to provide positive identification of persons underground at any one time.

Comprehensive Mine Safety Program: The term “Comprehensive Mine Safety Program” means a mine specific set of rules and regulations to govern the health and safety of all employees of the mine.

Conspicuous: The term “Conspicuous” means easy to notice; obvious.

Effectively Grounded: The term “Effectively Grounded” is an expression which means grounded through grounding connection of sufficiently low impedance (inherent or intentionally added or both) so that fault grounds which may occur cannot build up voltages in excess of limits established for apparatus, circuits, or systems so grounded.

Electrical Work: The term “Electrical Work” shall mean work consisting primarily of electrical construction, installation, testing, inspection, maintenance and repair tasks on electrical coal mining equipment, apparatus, circuits, and/or distribution circuits used in or around a coal mine.

Firedamp: The term “Firedamp” means a combustible gas, chiefly methane, occurring naturally in coal mines and forming explosive mixtures with air.

Hazardous Substance: The term “Hazardous Substance” means a substance which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful, is likely to cause death or injury.

Imminent Danger: The term “Imminent Danger” means the existence of any condition or practice in a mine which could be expected to cause death or serious physical harm before such condition or practice can be abated.

Inactive workings: The term “Inactive Workings” includes all portions of a mine in which operations have been suspended for an indefinite period, but have not been abandoned.

Independent Contractor: The term “Independent Contractor” shall mean any firm, corporation, partnership, or individual that contracts to perform services or construction at a coal mine, excluding mine vendors, office equipment supplier, services or delivery personnel.

MHST: The term “MHST” means West Virginia Office of Miners’ Health, Safety and Training.

Mine Foreman: The term “Mine Foreman” shall mean the certified person whom the operator or superintendent shall place in charge of the workings of the underground mine and of the persons employed therein.

Mine Power Center or Distribution Center: The term “Mine Power Center or Distribution Center” shall mean a combined transformer or distribution unit, complete within a metal enclosure from which one (1) or more low-voltage power circuits are taken.

Miner: The term “Miner” shall mean any individual working in an underground mine who is certified by the Office of Miners’ Health, Safety and Training.

MSHA: The term “MSHA” means Federal Mine Safety and Health Administration.

Notice of Assessment: The term “Notice of Assessment” shall mean a notice issued for the assessment of a civil penalty pursuant to the provisions of Chapter 22A, Article 1, Section 21 of the Code.

Notice of Violation: The term “Notice of Violation” shall mean a notice issued pursuant to the provisions of Chapter 22A, Article 1, Section 15 of the code.

Occupational Injury: The term “Occupational Injury” means any injury to a miner which occurs at a mine for which medical treatment is administered, or which results in death or loss of consciousness, inability to perform all duties on any day after an injury, temporary assignment to other duties, or transfer to another job.

On-shift Examination: The term “On-shift Examination” means an examination performed every two (2) hours by the section foreman during his production shift.

Operator: The term “Operator” shall mean any firm, corporation, partnership, or individual operation at any coal mine or part thereof, or engaged in the construction of any facility associated with a coal mine, and shall include any independent contractor at a coal mine.

Outburst: The term “Outburst” means the sudden explosion of coal from one or more coal pillars or faces accompanied by a violent release of energy.

Pre-shift Examination: The term “Pre-shift Examination” means an examination conducted by a certified foreman within three (3) hours prior to the beginning of each shift and before any miner enters the mine.

Primary Escapeway: The term “Primary Escapeway” means the main, direct escape route from the working section to the surface, located in intake air.

Qualified Person: The term “Qualified Person” shall mean a person who has completed an examination and is considered qualified on record by the Office of Miners’ Health, Safety and Training.

Regulator: The term “Regulator” means a variable, partial opening in a stopping built to regulate air flow.

Representative of Miners: The term “Representative of Miners” shall mean a person or organization designated by a group of miners to act as their representative before the Office of Miners’ Health, Safety and Training.

Return Air: The term "Return Air" means a ventilating air current that has been used to ventilate a working section.

Seal: The term "Seal" means a stopping built of greater thickness and more substantial construction used to isolate abandoned areas of a mine from the active workings.

Secondary Escapeway: The term "Secondary Escapeway" means a designated alternate escape route, to be used when other routes of escape cannot be used.

Serious Personal Injury: The term "Serious Personal Injury" means an event at a mine which causes bodily injury to an individual which requires such individual to be admitted to a medical facility overnight for reasons other than strains, sprains or observation as determined by a physician.

Shall: The term "Shall" means mandatory.

Should: The term "Should" means recommended.

Stoppings: The term "Stoppings" means a partition across openings erected to direct the ventilation current and to form escapeways.

Suitable: The term "Suitable" means that which fits and has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstances.

Superintendent: The term "Superintendent" shall mean the person who shall have, on behalf of the operator, immediate supervision of one (1) or more mines.

Supervisor: The term "Supervisor" shall mean a superintendent, mine foreman, assistant mine foreman, or any person specifically designated by the superintendent or mine foreman to supervise work of employees and who is acting pursuant to such specific designation and instructions.

Whitedamp: The term "Whitedamp" means an atmosphere containing carbon monoxide which is extremely toxic even in low concentration.

Working Section: The term "Working Section" means all areas of the coal mine from the loading point of the section to and including the working faces.

BELTS AND CONVEYORS

Q. What safety precautions should be taken relative to conveyor belts?

A. Electrically Grounded, free of coal dust, and properly supported.

Q. How should travelways be kept along conveyor belts?

A. A clear travelway at least 24 inches wide shall be provided on both sides of all conveyor belts.

Q. What shall the examiner place at or near each belt head and along each belt conveyor examined?

A. Date, time and initials.

Q. What type of material are belt conveyors required to be made of?

A. Flame resistant.

Q. On belts conveyors that do not transport miners, at what intervals are start and stop controls required to be installed?

A. Not to exceed 1000 feet.

Q. How shall start and stop controls be installed and positioned along belt conveyors?

A. So as to be readily available.

Q. What shall be provided where miners are required to cross moving belts?

A. Suitable crossing facilities.

Q. When are belt conveyors required to be inspected?

A. Following the last production shift each week, before holidays and vacation periods, no more than 3 hours before the start of each production shift, and during each production shift.

Q. What records of belt inspections are required to be kept?

A. Records of daily inspections.

Q. What shall all belt conveyors and belt conveyor entries be inspected for daily?

A. Unsafe conditions including, but not limited to, frozen rollers, rock falls, fires, gases.

Q. How much of the conveyor belt entry does the examiner need to travel?

A. Full extent of the conveyor belt entry.

Q. What shall be provided on all underground conveyor belts for indications of malfunctions?

A. Slip and sequence switches.

- Q. What is the purpose of erecting a Danger Sign?
A. To prevent persons from entering an area the examiner considers to be dangerous.
- Q. Who shall be notified when the examiner erects a Danger Sign?
A. The examiners immediate supervisor.
- Q. Who may enter an area that has been posted with a Danger Sign?
A. State and federal inspectors, miners representative and persons authorized by mine management to correct the condition.
- Q. What must be done before a person is permitted to perform any work within the confines of the cargo space of a crusher or feeder?
A. The crusher or feeder must be de-energized and locked out.
- Q. What must be done when belt, chain or rope drives and the moving parts of machinery are within seven (7) feet of the floor, ground or platform level, unless isolated?
A. Guarded adequately.
- Q. What is required when incandescent lamps are used to illuminate areas in a belt entry?
A. The lamps shall be installed in weatherproof sockets and shall not come in contact with any combustible material.
- Q. When shall machinery not be lubricated or repaired?
A. While in motion, except where safe remote lubricating devices are used.
- Q. When shall machinery be started that has been lubricated or repaired?
A. Only after the person(s) doing the lubricating or repairing has been given a clear signal.
- Q. What must be done before machinery with missing guards is put back into use?
A. The guards shall be replaced.
- Q. Where can the specific CO monitoring plan information for a mine be found?
A. In the ventilation plan for that mine.
- Q. At what level of carbon monoxide (CO) in the belt entry shall an effective warning signal be activated?
A. 10 parts per million (PPM) above the established ambient level.
- Q. The CO sensors along the belt entry shall not exceed what distance?
A. The sensors shall not exceed 1,000 feet. However, if velocities are less than 50 feet per minute (fpm) then spacing must not exceed 350 feet.

Q. What is required when an onshift of the belt conveyor and the belt conveyor entry has not been made during the preceding shift?

A. An examination of the belt conveyor and belt conveyor entry prior to starting of the belt.

Q. What shall not accumulate along belt conveyor entries?

A. Fine, dry coal and coal dust.

Q. When shall all belt conveyors be inspected for fires (Fire Run)?

A. Following the last production shift each week, before holidays and vacation periods.

Q. What is required by the operator where stockpiles are provided with draw-off feeders?

A. A plan submitted and approved by the Director of MHST.

Note: The following questions relate to miners riding belts. Currently, there are underground state mining laws pertaining to miners riding belts. However, miners are not permitted to ride belts unless safeguards are in place to permit this practice.

Q. What shall be provided where miners load or unload from conveyor belts?

A. Adequate clearance of at least 36 inches, proper illumination at all loading and unloading stations and suitable communications.

Q. What is the maximum speed of belt permitted when miners are being transported?

A. 250 feet per minute when minimum clearance is 18 inches. 300 feet per minute when minimum clearance is 24 inches.

Q. When must miners not ride on belts?

A. When supplies are being transported.

Q. How far apart must miners be spaced when riding belts?

A. At least six (6) feet apart.

Q. What is the minimum roof clearance when miners ride belts?

A. At least eighteen (18) inches from the top of the roller.

Q. When the height of the coal seam permits, what shall the clearance be?

A. Not less than twenty-four (24) inches.

Q. Who shall supervise the loading and unloading of belts used for mantrips?

A. Assistant mine foreman or person designated by the mine foreman.

Q. If a conveyor belt is used to transport miners, what must be done after supplies are transported on such conveyor belt prior to the transport of miners?

A. Examined for unsafe conditions.

Q. On conveyor belts used for transporting miners, what is required to stop such belt at any location?

A. Positive action stop controls.

Q. What is required when men are loading and unloading a belt conveyor used for mantrips?

A. Belt conveyor shall be stopped.



ROOF CONTROL

Q. What should each employee, or the official in charge, do before work is started?

A. They should thoroughly examine the roof and general conditions and see that the necessary roof support is provided to make the place safe.

Q. What is required of all active underground roadways, travelways, and working places?

A. The roof and ribs shall be supported or otherwise controlled adequately to protect persons from falls of the roof and ribs.

Q. How should dangerous roof conditions be handled?

A. They shall be corrected immediately.

Q. When should broken, rotten or inferior timbers be replaced?

A. Promptly.

Q. What shall be done with loose, dangerous, or unusual overhanging ribs, brows or roof?

A. They shall be removed or carefully secured.

Q. How should timbers be set with respect to the belt?

A. So that proper clearance is maintained.

Q. What protection is a cap piece to a timber?

A. It takes the first weight by crushing, without affecting the strength of the timber.

Q. What are the common errors made when setting timbers?

A. Setting the timbers on uneven surfaces, using cap pieces that are too small, wedging the timbers improperly, not setting the timbers vertically, and using inadequate or crooked timbers.

Q. What document is required for each mine that outlines ways to effectively control and support the mine roof?

A. An approved roof control plan.

Q. What is a major cause of fatalities in coal mines?

A. Falls of roof, rib and coal.

Q. When are apprentice miners permitted to set temporary supports?

A. When under the direct supervision of a certified miner.

- Q. What shall be done before a miner is engaged in any activity involving the securing of roof or ribs during a shift?
A. The immediate supervisor shall at the onset of any such shift, orally review those parts of the roof control plan relevant to the type of mining and roof control to be pursued by such miner.
- Q. So as not to expose the miner to unusual danger from roof falls, what shall be the maximum width of road ways?
A. Shall not exceed twenty (20) feet unless additional cross-sectional support is added.
- Q. What shall be done in all areas where the roof is broken?
A. Such roof should have temporary roof supports installed before any other work being performed in the area.
- Q. What shape does a weak and broken roof assume in an entry after all the loose material has fallen?
A. The form of an arch.
- Q. How is the strength of the roof affected by moisture?
A. The roof is often weakened by moisture.
- Q. What shall the fireboss do when they find a place in dangerous condition?
A. The fireboss shall remain until the place is made safe or dangered off.
- Q. When should a miner be prohibited from working in any area?
A. Before it has been made safe.
- Q. What is the proper method of testing roof?
A. By sight, sound and vibration when tapped with a solid instrument.
- Q. What is the most dangerous roof?
A. One which conceals slips and kettle bottoms.
- Q. What is a kettle bottom?
A. A large boulder with tapering edges, embedded loosely in the roof.
- Q. What form of hand tool should be used in taking down slate?
A. A long slate bar.
- Q. What is roof bolting?
A. A method of supporting the roof by tying the roof strata together.
- Q. What material is used to tie the strata together?
A. Roof bolts and bearing plates.
- Q. Who is responsible to make sure the travelways in the belt entry are safe to travel?
A. The Examiner

Q. What size roof bolts and plates shall be used?

A. Size of bolts and plates are specified in the roof control plan.

Q. Are all roof control plans the same for all mines?

A. No.

Q. What is the minimum diameter of a post used for roof support?

A. Four inches or a cross-sectional area of not less than thirteen (13) square inches.

Q. What is the minimum bearing surface of jacks used for roof support?

A. Thirty-six (36) square inches.

Q. When a hazardous roof, face or rib condition is detected, when shall corrective action be taken?

A. Before any work or travel in the area.

Q. Who has the primary responsibility to prevent injuries and deaths resulting from working under unsupported roof?

A. The mine operator.

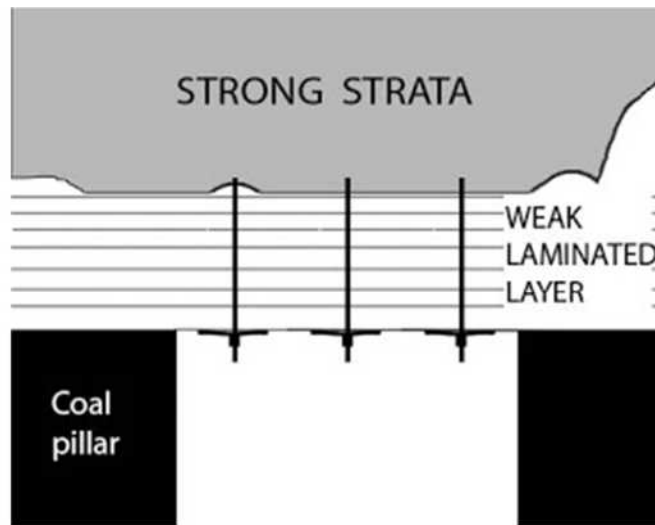
Q. What is required of all underground roadways, travelways, and working places?

A. The roof and rib shall be supported.

Q. A visual examination of what shall be made immediately before any work is started?

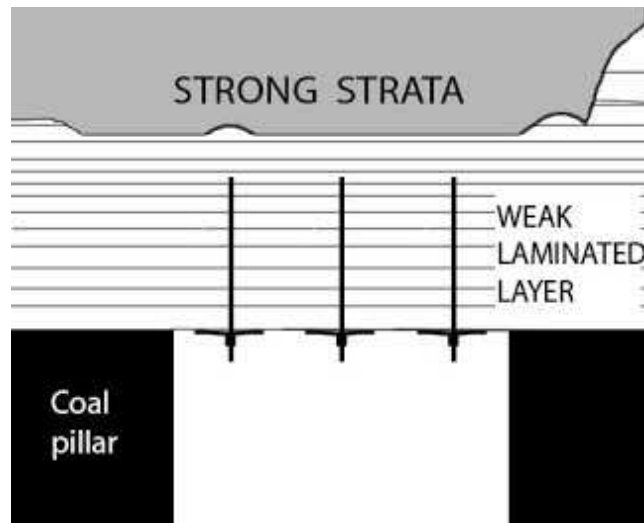
A. Roof, face and ribs.





Suspension effect-

When the underground opening is created in mines, the laminated immediate roof tends to sag and separates from the stronger layer. The sag and suspension are reduced by clamping the layers together and suspending them from the self-supporting roof.

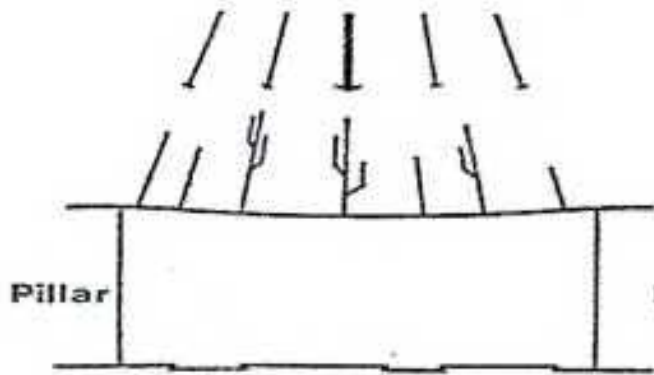


Beam effect-

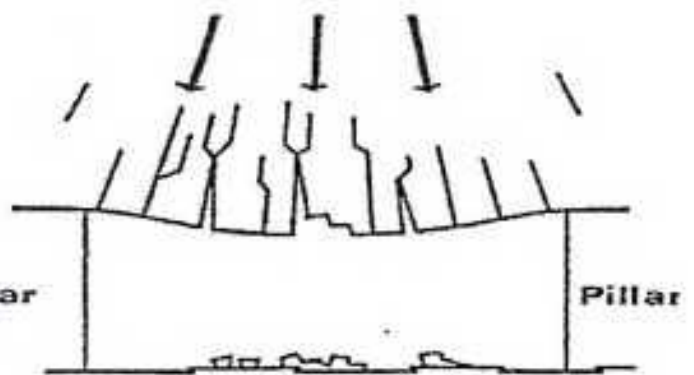
The strata overlaying into the roadways are thinly laminated without any strong competent strata. Therefore roof bolt suspends and serves bind the all thin layers in the form of a beam.

(E.g., if a 5 mm and 5 meters plank supported at both ends, it will sag over a period. Therefore, it will bind with bolt and clamp of several thin planks it would be much stronger.)

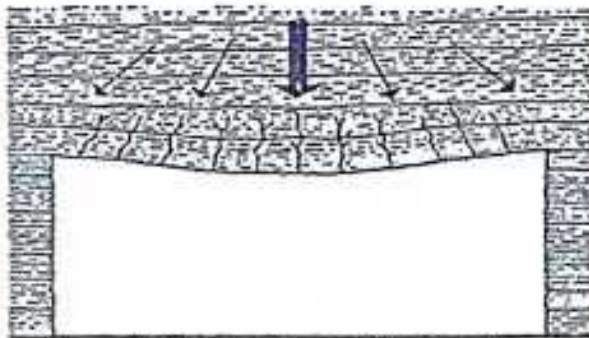
SEQUENCE OF A ROOF FALL



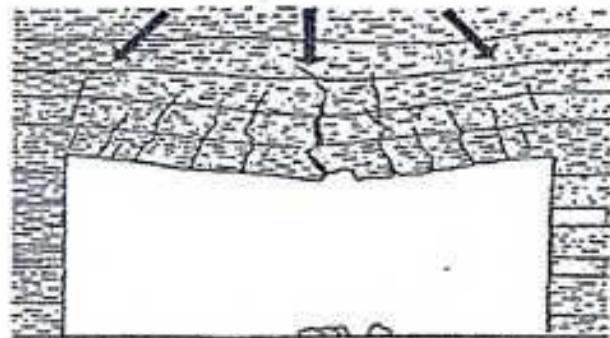
In the first stage, the roof begins to sag and tension cracks appear



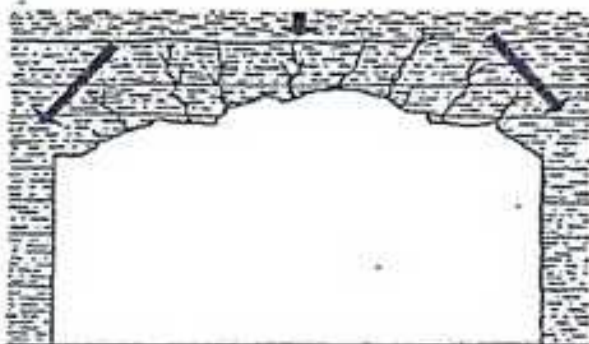
The center of the roof breaks, wedging itself, and the vertical load increases



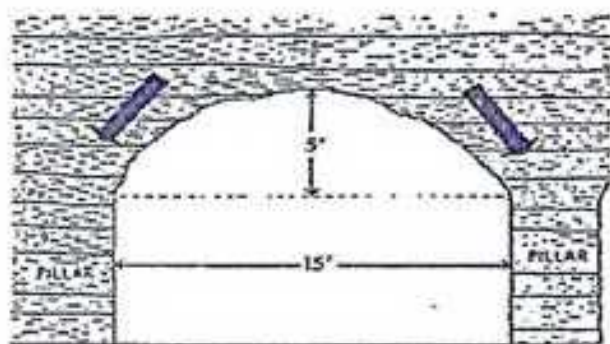
1. In early stages, the roof begins to sag, then tension cracks begin to appear.



2. Roof center breaks, wedges itself, and the vertical load greatly increases.



3. Vertical load is transferred to pillars as roof works its way into an arch.



4. Roof has completely fell and forces are transmitted to pillars. Falling may take minutes, days or even months.

VENTILATION

Q. What is the purpose of mine ventilation?

A. To provide sufficient pure air to the employees and to dilute, render harmless, and carry away the dangerous and noxious gases and dust.

Q. What must be done where coal is dumped near intake opening?

A. Reasonable provisions must be made to prevent dust from entering the mine.

Q. When should changes in ventilation be made?

A. When the mine is idle.

Q. What effect do obstructions in airways have upon the quantity of air being circulated?

A. The quantity is decreased.

Q. How are ventilating currents controlled?

A. By the use of stoppings, doors, overcasts, undercasts, regulators, check curtains, line brattice, and auxiliary fans.

Q. What is the principal requirement for permanent stoppings?

A. They should be airtight.

Q. What materials are used to construct stoppings?

A. Incombustible materials.

Q. Why should idle dead-end places not be permitted?

A. Ventilation is uncertain and gases may accumulate.

Q. What is a regulator?

A. A variable partial obstruction in an airway.

Q. Who determines where regulators are placed?

A. The mine foreman.

Q. What is the purpose of a regulator?

A. To control the distribution of the air by regulating the resistance to flow in an air split.

Q. What is the effect of closing a regulator on the quantity of air entering a split?

A. The quantity is decreased.

Q. What plan determines the direction of air and the quantity of air in the belt conveyor entry?

A. Ventilation Plan.

- Q. Why are regulators essential to the ventilation of a mine?
A. They proportion the air to meet the requirement of each individual split.
- Q. What are the main requirements of airways?
A. That they are of sufficient area and kept free of obstructions.
- Q. What should be the minimum dimensions of man doors in permanent stoppings or overcasts?
A. Thirty (30) inches square.
- Q. At what intervals shall man doors be installed between the intake and return airways?
A. Six hundred (600) feet when the height of the coal is over forty-eight inches. Three hundred (300) feet when the height of the coal is under forty-eight inches.
- Q. In what direction should doors swing to close?
A. In the direction of the air current.
- Q. What is used to isolate the intake air escapeway entry from other entries?
A. Permanent stoppings.
- Q. What are the main requirements of an overcast?
A. To provide sufficient area for the air current and to permit a smooth uninterrupted flow of air.
- Q. What should be done when conveyors are extended through stoppings?
A. A box check should be erected to prevent excessive air leakage.
- Q. What is the speed of a ventilating current called?
A. The velocity.
- Q. Why should excessively high velocities be avoided?
A. High velocities increase the necessary ventilating pressure and power consumption, keeps coal dust in suspension, and may cause discomfort to the workers.
- Q. Why should extremely low velocities be avoided?
A. Low velocities will not properly sweep out gases and dust.
- Q. What is short circuiting of the air?
A. Permitting the air to enter the return before reaching the faces.
- Q. What shall be done when 1% or greater methane is found in the belt conveyor entry?
A. 1. Except intrinsically safe atmospheric monitoring systems (AMS), electrically powered equipment in the affected area shall be de-energized and other mechanized equipment shall be shut off.

2. Changes or adjustments shall be made at once to the ventilation system to reduce the concentration of methane to less than one percent.

3. No other work shall be permitted in the affected area until the methane concentration is less than one percent.

Q. What shall be done when 1.5% or greater methane is found in the belt conveyor entry?

A. 1. Except for the mine foreman, assistant mine foreman or individuals authorized by the mine foreman or assistant mine foreman, all individuals shall be withdrawn from the affected area.

2. Except for intrinsically safe AMS, electrically powered equipment in the affected area shall be disconnected at the power source.

3. Changes or adjustments shall be made at once to the ventilation system to reduce the concentration of methane to less than one percent.

4. No other work shall be permitted in the affected area until the methane concentration is less than one percent.

Q. Which plan determines the direction air is moving in the belt entry?

A. The approved mine ventilation plan.



MINE GASES

Q. What is oxygen (O₂)?

A. It is a tasteless, odorless and colorless gas which supports life and combustion.

Q. What percent of oxygen can a person most easily work in?

A. Twenty-one percent (21%).

Q. What must be the minimum oxygen content of the air delivered to active workings?

A. 19.5 percent (19.5%).

Q. What is nitrogen (N₂)?

A. It is a tasteless, odorless and colorless gas which will neither support life nor combustion.

Q. What is carbon dioxide (CO₂)?

A. Carbon dioxide is a colorless and odorless gas formed by the chemical combination of carbon and oxygen.

Q. What is methane (CH₄)?

A. A colorless, odorless and tasteless combustible gas.

Q. Where is methane found?

A. In almost all coal mines.

Q. What is the source of methane in coal mines?

A. It is liberated from coal and adjoining strata.

Q. What is the range of explosibility for methane?

A. Between five percent (5%) and fifteen percent (15%).

Q. What is the percentage of methane required for maximum explosive violence?

A. Ten Percent (10%).

Q. What effect does the presence of methane have upon the explosibility of coal dust?

A. The coal dust is more easily ignited, and the force of the explosion is greater.

Q. How can methane be detected?

A. Multi-gas detectors, methane detectors and testers, chemical analysis.

Q. Where shall tests for methane concentrations with hand held methane detectors be taken?

A. The tests shall be made at least twelve (12) inches from the roof, face, ribs, and floor.

- Q. Why should tests for methane be taken at least twelve (12) inches from the roof, face, ribs, and floor?
A. To check for the accumulation of mine gases in any opening and not the liberation of gases from the roof, face, ribs, and floor.
- Q. Where is methane normally found?
A. Since the specific gravity of methane is .555 which indicates that it is lighter than air, it is normally found in high places.
- Q. What is carbon monoxide (CO)?
A. It is a colorless, odorless, tasteless, combustible and poisonous gas.
- Q. How can carbon monoxide be detected?
A. Multi-gas detectors, carbon monoxide detectors, chemical analysis.
- Q. What is the source of carbon monoxide?
A. It is the product of incomplete combustion (combustion with insufficient oxygen).
- Q. When is carbon monoxide most likely to be found in mines?
A. When there is a mine fire or after an explosion.
- Q. What effect does carbon monoxide have on life?
A. It is extremely poisonous.
- Q. How does CO cause injury to life?
A. By combining with the hemoglobin of the blood and excluding oxygen.
- Q. What is hydrogen (H₂)?
A. It is a colorless, odorless and tasteless gas.
- Q. How is hydrogen formed in a mine?
A. It is formed by mine fires, explosions and by charging batteries.
- Q. Is hydrogen explosive?
A. Yes, over a wide range.
- Q. The earth's atmosphere consists of what percent oxygen?
A. Approximately twenty-one (21) percent.
- Q. The earth's atmosphere consists of what percent nitrogen?
A. Approximately seventy-eight (78) percent.
- Q. What is the percentage of oxygen below which no explosion of a methane air mixture can occur?
A. Twelve percent (12%).

GAS TESTING

THE FOLLOWING ARE DETECTOR ALARM LEVELS FOR CH₄, CO, and O₂.

1% CH₄ LOW ALARM LEVEL

1.5% CH₄ HIGH ALARM LEVEL

50 PPM OR LESS CO LOW ALARM LEVEL

100 PPM OR LESS CO HIGH ALARM LEVEL

19.5% O₂ LOW ALARM LEVEL

23% O₂ HIGH ALARM LEVEL

THE EXPLOSIVE RANGE OF METHANE IS 5% TO 15%.

METHANE (CH₄) SHOULD BE CHECKED AT LEAST 12 INCHES FROM THE ROOF, FACE, RIB AND FLOOR.

CARBON MONOXIDE (CO) GENERALLY IS CHECKED ABOUT WAIST HIGH.

LOW OXYGEN (O₂) IS GENERALLY CHECKED BELOW THE WAIST.

NO ELECTRICAL EQUIPMENT SHALL BE OPERATED IN A MINE FOR A PERIOD LONGER THAN TWENTY (20) MINUTES WITHOUT A METHANE EXAMINATION.

POWER TO EQUIPMENT SHALL BE REMOVED WHEN 1% OR GREATER METHANE (CH₄) IS DETECTED.

PERSONS WHOSE DUTIES REQUIRE THEM TO TAKE A GAS EXAMINATION SHALL BE EXAMINED ANNUALLY.

GAS DETECTORS SHALL BE CALIBRATED WITHIN THIRTY (30) CALENDAR DAYS.

THE FOLLOWING ARE THE CHECKS PERFORMED ON A GAS DETECTOR PRIOR TO USE.

1. CHECK CASE INTEGRITY
2. CHECK SCREEN READABILITY
3. CHECK SENSOR SCREENS
4. CHECK AUDIBLE AND VISIBLE ALARMS
5. CHECK BATTERY LEVEL
6. CHECK SENSOR ZERO
7. CHECK CALIBRATION

FIRE PROTECTION/FIRE HAZARDS

Q. Where shall water lines be located in relation to belt conveyors?

A. Water lines shall be installed parallel to the entire length of the belt conveyor.

Q. Where shall fire hose outlets with valves be located for water lines along belt conveyors?

A. At 300 ft. intervals along the belt conveyor and at tailpieces.

Q. What shall be installed at strategic locations along the belt conveyor?

A. At least five hundred (500) feet of fire hose with nozzle and fittings suitable for connection.

Q. May waterlines be installed in entries adjacent to the belt conveyor entry?

A. Yes, provided the fire hose outlets project into the belt conveyor entry.

Q. What shall each locomotive, track or off-track self-propelled mantrip car or personnel carrier be equipped with?

A. One (1) portable fire extinguisher.

Q. What shall be provided at each permanent electrical installation?

A. Two (2) portable fire extinguishers.

Q. What shall be provided at temporary electrical installations?

A. One (1) portable fire extinguisher and two hundred and forty (240) pounds of rock dust or equivalent.

Q. What shall be provided at each permanent underground oil storage station?

A. Two (2) portable fire extinguishers and two hundred and forty (240) pounds of rock dust or equivalent.

Q. What fire protection is required at locations where cutting, welding, or soldering with arc or flame is being done?

A. One portable fire extinguisher or two hundred and forty (240) pounds of rock dust or equivalent.

Q. What fire protection is required at each wooden door through which power lines pass?

A. One portable fire extinguisher or two hundred and forty (240) pounds of rock dust or equivalent.

Q. What should all employees know relative to fire extinguishers?

A. They should know how to use them properly.

- Q. What is the purpose of a CO monitoring system?
A. The CO monitoring system is an early-warning fire detection system that provides alert and alarm signals when abnormal amounts of CO are sensed.
- Q. Where would you find the installation requirements for the CO monitoring system?
A. 30 CFR, Ventilation Plan, ERP Plan.
- Q. Where would you find the alarm and response requirements for the CO system?
A. 30 CFR, Ventilation Plan, ERP Plan.
- Q. What are the requirements for fire hose utilized in underground coal mines?
A. The fire hose shall be rubber-lined, mildew-proof and the cover shall be of flame-resistant qualities, meeting the requirements for hose by MSHA.
- Q. What shall be the maximum water pressure in the hose nozzle?
A. The maximum water pressure shall not exceed 100 p.s.i.g.
- Q. What is the bursting pressure requirement for fire hose utilized in underground coal mines?
A. The bursting pressure shall be at least four times higher than the static pressure at the mine.
- Q. What is the nominal weight of a fire extinguisher approved for use in a coal mine?
A. Five (5) pounds.
- Q. What type of fire extinguishers are approved for use in a coal mine?
A. A multipurpose dry chemical type having a 2A 10BC or higher rating.
- Q. What type of oil is required where electric driven hydraulic systems are used at unattended underground loading points?
A. Fireproof oil or emulsion.
- Q. What shall always be shown on the mine map and kept available at the mine office?
A. The location of pipelines, valves, and fire taps.
- Q. What shall be the capacity of waterlines utilized for firefighting?
A. Waterlines shall be capable of delivering fifty (50) gallons of water per minute at a nozzle pressure of fifty (50) psi.
- Q. What firefighting equipment shall be installed at each main and secondary conveyor drive that are located underground?
A. Deluge-type water sprays, water sprinklers, dry chemical sprinkler system or foam generators which are designed to be automatically activated in the event of a fire or rise in the temperature at or near the belt drive.

Q. What hazards are created when belts rub structures, belts run is coal spillage, rollers are stuck, rollers turn in spillage, rollers with damaged bearings, etc.?

A. Fire hazards are created by these frictional ignition potentials.

Q. What excellent fire prevention measure can be used in all entries, especially the belt entry?

A. Heavy coating of rock dust.

Q. What can be done to reduce the amount of airborne coal dust in belt entries?

A. Water or water with a wetting agent added to it should be applied to dust at its source.



KNOW THE LOCATION OF ALL FIREFIGHTING EQUIPMENT, IF YOU NEED IT THEN IT MAY BE TOO LATE TO TRY TO FIND IT!

INSPECTION AND REPORTING PROCEDURES

Q. Who must be notified in the event of a fire in or about any coal mine?

A. The Office of Miners' Health, Safety and Training.

Q. How soon must the Office of Miners' Health, Safety and Training be notified in case of a mine fire?

A. Immediately.

Q. Where shall the belt examiner travel while conducting their examinations?

A. The full extent of the belt conveyor or the belt conveyor entry assigned.

Q. What shall the belt examiner do at or near each belt head and along each belt conveyor being examined?

A. Place their initials, date and time of the examinations.

Q. What shall the belt examiner do when a dangerous condition is found?

A. Erect a danger sign to prevent other persons from entering the area and notify their immediate supervisor.

Q. What report must belt examiners, mine foreman-fireboss or assistant mine foreman-fireboss keep?

A. A record of their examinations, including comments concerning the physical condition of the belt conveyor and the area where the belt conveyor is located.

Q. Where shall the record of belt conveyor examinations be kept?

A. In a book provided for that purpose.

Q. Who shall examine and countersign the book of belt conveyor examinations?

A. The mine foreman or their assistant and by the person conducting such examination on the next oncoming shift.

Q. What should be repeated on the daily report?

A. Unsatisfactory conditions and practices previously reported but not corrected.

Q. Who is permitted to inspect the daily reports of the mine examinations?

A. All interested persons.

Q. If during the examination the belt examiner (fireboss) finds a condition which is considered dangerous to persons entering such areas, what action should be taken?

A. The examiner shall place a conspicuous danger sign at all entrances to such place or places, report to the mine foreman, and record in the fireboss book.

Q. When shall the belt conveyor and the belt conveyor entry be examined?
A. Preshift examinations, onshift examinations, and supplemental examinations.

Q. Can the belt examiner fireboss areas outside of the belt examiner area of responsibility?
A. No.

Q. What is a preshift examination?
A. If a mine has been idled for any period of time, then a preshift examination for hazardous conditions shall be conducted by a mine foreman, assistant mine foreman, or fireboss within three (3) hours prior to anyone entering the mine. Afterwards, preshift examinations shall be performed every eight (8) hours provided work is continuous.

Q. What is an onshift examination?
A. An onshift examination for unsafe conditions shall be made of belt conveyors on which coal is transported and the belt conveyor entries during each coal producing shift.

Q. What is a supplemental examination?
A. A supplemental examination for hazardous conditions shall be performed by a mine foreman, assistant mine foreman, or belt examiner within three (3) hours before any person enters areas of the mine not covered during the preshift examination.

Q. How often shall persons required to use approved methane detecting device or other approved methane detectors be examined to check competency by a qualified official from the Office of Miners' Health, Safety and Training?
A. At least annually.

Q. What should the belt examiner do if he encounters an emergency situation at the mine?
A. Notify the Mine Foreman/ Responsible person immediately



COAL AND COAL DUST

Q. What causes the propagation of explosions through large areas of the mines?

A. Coal Dust.

Q. How does coal dust contribute to the severity of an explosion?

A. By being raised in clouds and ignited, the explosion is propagated through the mine.

Q. When is it possible to have an explosion in a coal mine with no methane present?

A. When quantities of coal dust are raised in a sufficiently dense cloud in the presence of an ignition source.

Q. What are the main causes of coal dust explosions?

A. Explosions of methane, electric arcs and explosives.

Q. How much coal dust is sufficient to propagate a coal dust explosion?

A. About eight hundredths (.08) or one twelfth (1/12) of an ounce per cubic foot of air.

Q. Which coal dust in West Virginia will not explode?

A. None.

Q. What effect does fineness of coal dust have upon its explosibility?

A. Fineness will increase the explosibility.

Q. Will damp coal dust explode?

A. Yes, dampness causes the dust particles to cohere, and greater force is required to separate them and bring them into suspension. Once in suspension, if ignited, they will explode.

Q. How can the explosibility of coal dust be removed?

A. By the addition of incombustible material.

Q. What shall be the incombustible content of mine dust in all entries?

A. At least eighty (80) percent.

Q. What shall be done with accumulations of fine, dry coal dust in a mine?

A. Fine, dry coal dust shall be removed from the mine.

Q. How shall dry and dusty areas of a coal mine be treated?

A. They shall be thoroughly rock dusted.

Q. What benefit is derived from rock dusting?

A. The explosibility of coal dust and the danger of an explosion being propagated is reduced.

Q. How shall unusual quantities of coal dust be kept out of suspension?

A. By sprinkling with water or other dust allaying methods.

Q. Who shall be required to wear respirators?

A. Miners exposed for short periods to gas, dust, fumes and mist.

Q. What effect does the presence of small amounts of methane have upon the explosibility of coal dust?

A. It increases the explosibility.

Q. How is coal dust allayed in the belt conveyor entry?

A. Water sprays and rock dust.

Q. What is to be done with dangerous accumulations of fine, dry coal and coal dust in the belt conveyor entry?

A. It shall be removed from the mine and rock dust applied.

Q. What is respirable dust?

A. Respirable dust is dust of such size and consistency that allows it to be deposited in the lungs.



DUST CAN BE A HEALTH HAZARD AS WELL AS EXPLOSIVE, WE MUST BE PROACTIVE ABOUT DUST CONTROL!!

ELECTRICITY

Q. How shall telephone lines other than cables be installed?

A. Carried on insulators on the opposite side from power wires.

Q. How shall telephone wires be installed when crossing power wires?

A. They shall be insulated adequately.

Q. What shall be done to all power circuits and electrical equipment before work is done on such circuits and equipment?

A. They shall be de-energized except when necessary for trouble shooting testing.

Q. How shall circuit breakers and disconnecting switches underground be marked?

A. Marked for identification.

Q. What shall be done to power centers and portable transformers before they are moved from one location to another?

A. They shall be de-energized, unless the director grants permission to do otherwise.

Q. What is a wire?

A. A single conductor with or without an insulated cover.

Q. What is a cable?

A. Two or more insulated wires protected by an insulated outer jacket.

Q. Who shall perform work on electrical equipment?

A. Certified electrician or an apprentice electrician under the immediate supervision of a certified electrician.

Q. Who shall change fuses or circuit breaker sizes and settings?

A. Certified electrician or an apprentice electrician under the immediate supervision of a certified electrician.

Q. How often shall electric equipment be examined?

A. Weekly.

Q. Who can fireboss the electrical equipment installation located within the belt examiner's area of responsibility?

A. Mine foreman, assistant mine foreman, belt examiner.

Q. Can the belt examiner perform the weekly electrical examination of equipment located within the belt examiner's area of responsibility?

A. Only if the belt examiner is a certified electrician.

Q. What must be done if removing the power from a steeply inclined belt will not ensure against unintentional or inadvertent movement?

A. It must be physically blocked.

Q. What is the purpose of a slip switch?

A. It shuts down a conveyor drive motor when it senses the belt moving at a slower speed than the drive pulley. This reduces the potential of fire and the belt rubbing into.

Q. What is the purpose of a sequence switch?

A. It shuts down the belts if another belt stops out of the normal operating sequence. This reduces the potential of a running belt dumping coal onto an idle belt.



DE-ENERGIZE.....ELECTRICAL AND MECHANICAL!

INSTRUMENTS AND APPARATUS

Q. What does ppm stand for?

A. Parts per million.

Q. What type of methane detector calibration record should be maintained by the operator?

A. A written record.

Q. How often shall handheld methane detectors shall be calibrated?

A. Every 30 days

Q. In what type of atmosphere must the zero calibration be made?

A. Instrument must be in fresh air to perform the zero calibration.

Q. What is the purpose of the peak reading on a multi-gas detector?

A. To show the highest level of a gas recorded, or lowest oxygen reading recorded, since turning unit on or resetting the peak readings.

Q. What are smoke tubes used for?

A. Determining air direction and low air velocities when an anemometer is ineffective.

Q. What is an anemometer?

A. An instrument resembling a small disc fan used to measure lineal feet per minute (LFM) of air travel.

Q. How is an anemometer graduated?

A. To record the lineal feet per minute (LFM) of air travel.

Q. How are velocities determined by an anemometer?

A. By the lineal feet per minute of air travel as recorded on the dials by the revolution of the fan shaft.

Q. What period of time is usually taken for measuring air velocities?

A. Usually for one (1) minute.

Q. How is an anemometer used to obtain velocities in mines?

A. It is held in the air current for a given period of time, usually one minute, to determine lineal feet of air passing each minute.

Q. How is the area (square feet) of an airway determined?

A. By multiplying the height of the airway by the width of the airway. ($A=H \times W$)

Q. What is the area of an airway that is five (5) feet high and the width is eighteen (18) feet wide?

A. $A = 5 \text{ ft.} \times 18 \text{ ft.} = 90 \text{ sq. ft.}$

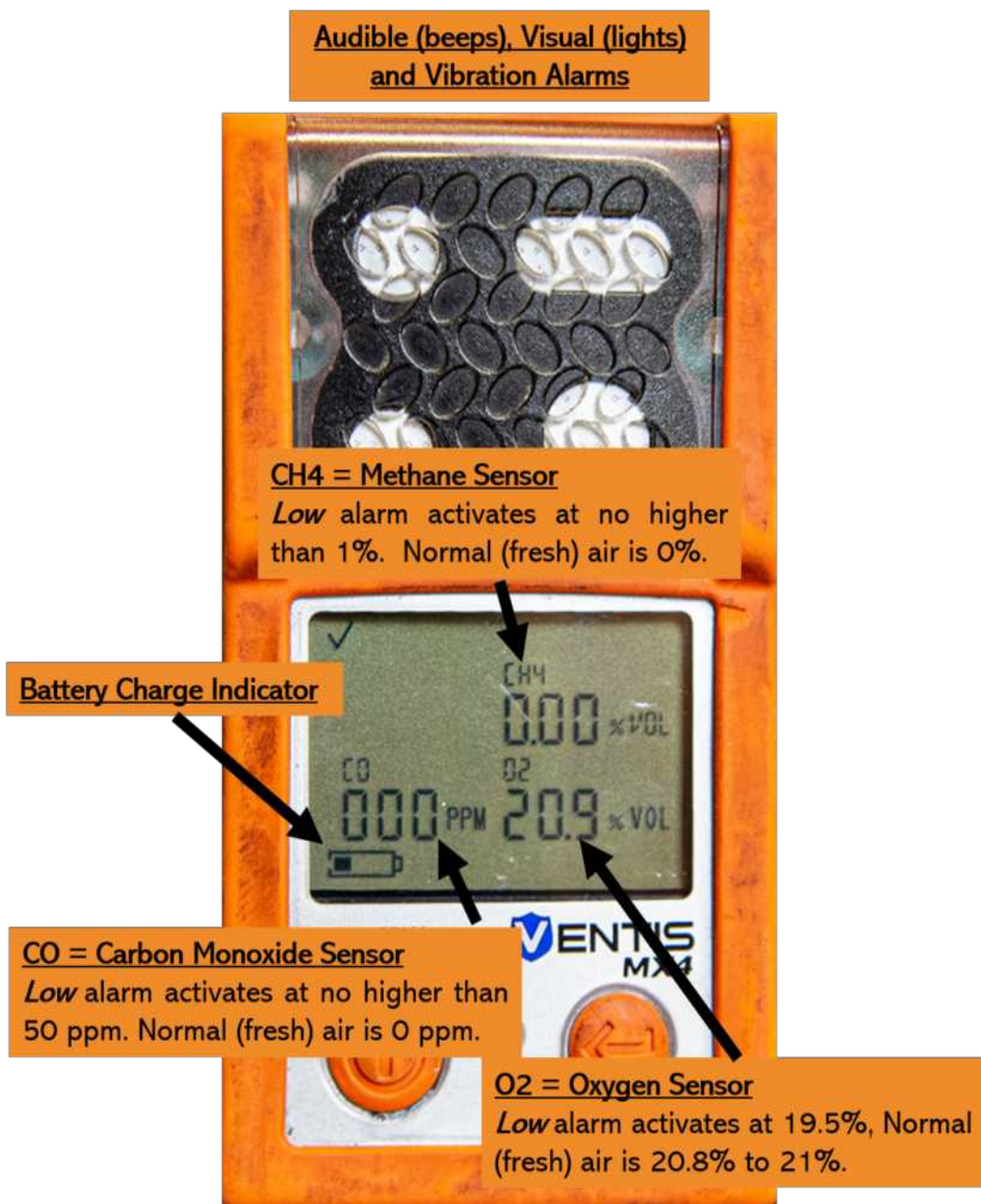
Q. What is the formula for determining the quantity (CFM) of air in an entry?

A. $\text{Quantity} = \text{Area} \times \text{Velocity}$ or $Q = A \times V$

Q. What is the quantity (CFM) of air moving through an airway five (5) feet high and eighteen (18) feet wide with an anemometer velocity reading of two hundred (200) lineal feet per minute (LFM)?

A. $Q = A \times V$

$Q = 90 \text{ sq. ft.} \times 200 \text{ LFM} = 18,000 \text{ CFM}$



GENERAL SAFETY

Q. Why were the mining laws enacted?

A. To ensure the safety of persons employed within or at the mines.

Q. How shall the direction to escapeways be marked?

A. By signs, conspicuously placed throughout the mine.

Q. What shall be done at entrances to dangerous places in a mine?

A. Entrances to dangerous places shall be dangered off.

Q. What shall be done when dangers are reported?

A. Such dangers should be removed promptly.

Q. In case it is impracticable to remove a danger, what shall be done?

A. Every person whose safety is threatened shall be notified.

Q. What kind of beverages shall not be taken into a mine?

A. Intoxicating.

Q. Why are safety rules necessary for the guidance of mine employees?

A. To establish standard mine safety practices.

Q. How does the enforcement of safety rules prevent accidents?

A. By preventing persons from performing acts which are known to be hazardous.

Q. Why should employees assist in offering suggestions relative to safety rules?

A. Habits of observation are developed and hazards are more readily recognized.

Q. What benefits can be secured from safety meetings?

A. They offer a medium for the exchange of ideas and experiences and provide means for more safety education.

Q. Why should safety rules be enforced?

A. Proper discipline is essential for the safe operation of a mine.

Q. What method shall be adopted and maintained to advise employees of the rules and regulations of the mine?

A. They shall be printed in the English language and posted in a conspicuous place about the mine.

Q. What record is required of miners entering and leaving mines?

A. A system of checking miners in and out of mines.

Q. Why should all injuries, even those of a trivial nature, be reported?

A. Serious consequences from infection may result from even trivial injuries.

- Q. How shall the scene of a fatal accident be left?
A. Unchanged until an investigation is made by MHST.
- Q. What shall be worn as head and foot protection?
A. Approved safety hats and safety-toed shoes.
- Q. What protection shall be provided for the eyes when grinding, cutting, welding or striking where particles may fly?
A. Adequate eye protection.
- Q. What is the danger of loose clothing?
A. It may become caught in moving machinery.
- Q. What is the duty of equipment operators and helpers relative to others in the vicinity while the equipment is in operation?
A. They shall not permit other persons to remain near the equipment.
- Q. Why should refuse or other material be prohibited from accumulating along a passageway?
A. Obstructions or lack of clearance may result in injury.
- Q. In what condition should mines be kept?
A. Clean and properly maintained.
- Q. How should illuminating and signal lights be maintained?
A. In proper operating condition.
- Q. What precaution should be observed when reassembling a machine with dangerous contact points or moving parts?
A. All guards or safety devices shall be replaced.
- Q. What precaution shall be taken before starting machinery?
A. Signals should be given, and the operator shall be in the proper position.
- Q. What precaution should be taken with machinery and equipment raised for repairs?
A. They should be securely blocked.
- Q. Why are repairs, adjustments or oiling of moving machinery prohibited?
A. Limbs or clothing may become entangled.
- Q. What should not be permitted to accumulate on machinery?
A. Oil and grease.
- Q. How should wire ropes be maintained?
A. Free from worn and broken strands and well lubricated.

Q. What danger exists when the employee is equipped with defective or improper tools?

A. Flying particles or uncontrolled action may cause serious injury.

Q. Who should be responsible for the condition of hand tools?

A. The user.

Q. What materials should not be permitted to accumulate in structures in or about mines?

A. Oil, grease and debris.

Q. What protective devices shall be provided for stairways, landings and elevated platforms?

A. Handrailings and toeboards where necessary.

Q. From what materials shall steps, landings and platforms be kept free?

A. Refuse and ice.

Q. How shall steps, landings and platforms be maintained?

A. In good repair.

Q. How shall oil and grease be carried and kept in a mine?

A. In closed containers.

Q. What shall be prohibited from places where oil and grease are kept?

A. Open lights, smoking and electricity.

Q. What shall be done before welders or torches are used in a mine?

A. A certified person shall examine for methane.

Q. Where shall welders and torches not be used?

A. Where danger of ignition of methane, oil, grease or coal dust is present.

Q. What examination shall be made before a machine is taken inby the last open crosscut to the working face?

A. Methane gas examination.

Q. At what percentage of gas is equipment prohibited to operate in?

A. One percent (1%).

Q. When shall respirators be worn?

A. When a person is exposed to dust, fumes and mist.

Q. How shall all flammable liquids be stored?

A. In approved containers or other safe dispensers.

Q. What type of gloves shall not be worn around equipment?

A. Gloves with gauntleted cuffs.

Q. Who may supervise an apprentice miner?

A. Mine foreman, assistant mine foreman or certified competent miner.

Q. Who is responsible to insure that apprentice miners are effectively supervised with regard to safety practices and to instruct apprentices in safe mining practices?

A. Mine operator.

Q. Who is responsible for the safety of an apprentice miner?

A. Mine foreman or assistant mine foreman.

Q. What first-aid equipment supplies are required to be maintained?

A. one stretcher (1)

one broken back board (1)

twenty-four triangular bandages (24)

eight four-inch bandage compresses (8)

sixteen two-inch bandage compresses (16)

twelve two-inch adhesive compresses (12)

one foille (1)

two cloth blankets (2)

one rubber blanket (1)

two tourniquets (2)

one 1-ounce bottle of aromatic spirits of ammonia (1 1-oz.)

two inflatable plastic arm splints (2)

two inflatable plastic leg splints (2)

six small splints, metal or wooden (6)

two cold packs (2)

one automated external defibrillator (AED) unit (1)

Q. What is required when a multi gas detector or other approved methane detector is taken underground?

A. Care shall be taken to insure that such detector or other device is in a permissible condition and such detector or device is tested before each shift.

Q. Where shall each operator of a coal mine maintain a supply of first-aid equipment?

A. 1) At mine dispatcher's office.

2) Close proximity to each mine entrance.

3) At the bottom of each regularly traveled slope or shaft, if more the one thousand (1,000) feet from the surface.

4) On each working section, not more than five hundred (500) feet from working faces.

Q. What personal safety equipment must be worn by an underground miner when working in seam heights of 48 inches and greater?

A. Metatarsal boots.

Q. What is a Comprehensive Mine Safety Program?

A. A mine specific set of rules and regulations governing the safety and training of all mine employees.

Q. What shall be practiced in all areas of underground coal mines, and in and around mine buildings and yards?

A. Good housekeeping.

Q. When can underground equipment powered by internal combustion engines be used?

A. When permission is granted by the Director of MHST.

Q. What is an accident?

A. Any mine explosion, ignition, fire, inundation, injury or death of any person.

Q. What is an imminent danger?

A. The existence of any condition or practice in a coal mine which could reasonably be expected to cause death or serious physical harm before such condition or practice can be abated.

Q. What distance shall two way communication facilities be located on the surface from the mine portal?

A. Within five hundred (500) feet.

Q. What shall the incoming communication signal activate on the working section?

A. An audible or visual alarm on the mine phone.

Q. When shall repairs be started to the mine communication system in the event of a failure?

A. Immediately.

Q. What record is required for oxygen and gas tanks in the mines?

A. The date tanks or cylinders are taken into the mine, and the date the tanks are removed from the mine.

Q. When may welding and cutting may be performed in a mine?

A. If all equipment and gauges are maintained in safe condition and not abused.

Q. What precautions are required by persons performing welding and cutting?

A. Adequate eye protection shall be used and precautions shall be taken to prevent other persons from exposure that might be harmful to their eyes.

Q. What type of tool is required to be provided to the person authorized to use oxygen and acetylene equipment?

A. A suitable wrench designed for compressed tanks.

Q. When are the hoses and gauges required to be disconnected from the oxygen and acetylene tanks?

A. When not in use and when being transported.

Q. What shall be done with empty oxygen and acetylene tanks?

A. They shall be marked empty and shall be removed from the mine promptly in safe containers provided for transportation.

Q. What restrictions are placed upon apprentice miners during the first 120 days of employment in a mine?

A. The apprentice miner shall work within sight and sound of the mine foreman, assistant mine foreman, or an experienced miner, and in a location that the mine foreman, assistant mine foreman, or experienced miner can effectively respond to cries for help of the apprentice. The location shall be on the same side of any belt, conveyor, or mining equipment.

Q. When shall any area of an underground coal mine be examined for hot spots after cutting and welding has been performed in that area?

A. Examinations for hot spots shall be performed immediately after work is completed. A second examination for hot spots shall be conducted by a qualified person within 2 hours, but no sooner than 30 minutes after the first examination has been completed.

Q. What must the qualified person do after the second examination for hot spots has been performed?

A. Record the findings of the second examination in a book provided for that purpose.

Q. Must each person underground wear an approved wireless emergency communications device?

A. Yes.

Q. What happens when any miner fails or refuses to undergo a drug or alcohol test?

A. All state mining certifications are suspended.

SAFETY IS NO ACCIDENT!
**DONT FORGET EXAMINERS TO DTI,
EXAMINE ROOF AND RIBS AND GAS TEST.**

DRAINAGE

Q. How shall travelways, haulageways and escapeways be maintained?

A. They should be properly drained and free from obstructions.

Q. What may be the effect of undrained bodies of water upon ventilation?

A. Air courses may be blocked so as to interfere with ventilation.

Q. What are the disadvantages of poorly drained mines?

A. Transportation is usually handicapped; it is difficult to maintain track as ballast washes out; it is difficult to keep rolling stock properly lubricated; rails and fittings become corroded; production is limited; and the filling of swags may interfere with ventilation.

Q. How can a mine be kept free from excessive amounts of water?

A. By ditching, siphon lines, pumping and by keeping water from entering.

Q. What is required when the primary escapeway that leads to a working section becomes blocked with water?

A. All persons must be withdrawn outby the affected area.

Q. What is a sump?

A. A natural or constructed basin at the lowest levels of a mine, used to gather water for pumping.

Q. If a pump is located within the belt examiner's area of responsibility, who can fireboss the pump installation?

A. Mine foreman, assistant mine foreman, belt examiner.



EMERGENCY SHELTERS, COMMUNICATIONS AND TRACKING AND SCSR'S

Q. What does "Emergency Shelter/Chamber" mean?

A. An enclosed space made from man-made materials whose function is to protect the occupants from hazardous gases and provide breathable air in the event escape is not possible.

Q. What does the term emergency communications mean?

A. The transmission and reception of voice, data, and /or information regarding an unexpected event requiring immediate action.

Q. What does wireless mean?

A. Allowing individual communications by a miner through a mine communication and tracking/locating system without a physical connection.

Q. What does the term "tracking/location" mean?

A. Knowing the physical location of miners at the moment of an accident and as escape progresses if the tracking/location system being used is still functional.

Q. What does "tracking/locating device" mean?

A. An integrated mine communications system for the purpose of providing the physical location of a miner during an emergency.

Q. How many minutes of breathable air should a stored SCSR provide the wearer?

A. Rated for 60 minutes.

Q. How shall each SCSR storage cache be housed?

A. In a container constructed to protect from normal operational damage, made of material that is non-combustible, easy to open during emergency escape and noted on an escapeway map.

Q. What other articles are required in storage caches located 500 feet from the working face?

A. Escape kit containing a hammer, tagline, a supply of chemical light sticks, and an escapeway map.

Q. Are other caches storages required?

A. Yes, at intervals that a miner may traverse in no more than 30 minutes traveling at a normal pace.

Q. What reflective signs are required at each cache storage box?

A. Self Rescuer.

Q. What is required in both primary and secondary escapeways?

A. Lifeline.

Q. What shall lifeline cords be attached to?

A. SCSR storage cache.

Q. Who shall record weekly inspections of emergency shelter/chambers and its' contents and record in a weekly ventilation examination book?

A. Mine foreman or mine examiner.

Q. When shall the current location of an emergency shelter/chamber be reviewed?

A. During weekly safety meetings.

Q. What is required on emergency shelter chambers to indicate unauthorized access?

A. Tamper proof tag.

Q. When shall the emergency communication and tracking system be monitored?

A. At all times in which one or more miners are underground.

Q. How many air courses must have 2-way communications?

A. 2 separate air courses, one of which must be in the intake air course.

Q. Who shall monitor the communications center?

A. It shall be staffed by miners holding a valid underground miner's certificate who is trained and knowledgeable of the installed communication/tracking systems, monitoring and warning devices, travelways, and mine layout.

Q. How shall lifeline cords be constructed?

A. They shall be constructed of flame resistance material, with reflective material every 25 feet, and directional indicators signifying route of escape not exceeding 100 feet, which shall be located in a manner for miners to use effectively to escape.

Q. What ability shall be included in a purposed communication/tracking system?

A. Knowing the location of all miners immediately prior to an event by tracking/locating device in the escapeways, normal work assignments, or notification of the communication center.

Q. What does the term "SCSR Storage Cache" mean?

A. Means a non-combustible container constructed to withstand normal mine conditions, protect a number of SCSR's, and allow easy access for inspection of SCSR's and easy access for miners who are escaping.

Q. What does the term "self-contained self-rescuer" mean?

A. Self-contained self-rescuer means a type of closed circuit self-contained breathing apparatus, or its equivalent, approved by MSHA for the purpose of isolating a miner from hazardous gases and provide breathable air to aid an escape.

Q. When should the SCSR be used?

A. Immediately at the first indication of a fire or an explosion.

Q. How may the service life of the SCSR be extended?

A. By remaining calm and resting quietly.

Q. How can it be determined that the SCSR is functional?

A. By checking daily the gauge or indicator and overall conditions.

Q. What effect does moisture have on the SCSR?

A. If moisture gets inside the unit, it can render the SCSR ineffective.

Q. Where shall the self-rescuer be located in respect to the miner?

A. Within immediate reach at all times and in compliance with the cache´ storage plan. Immediate reach is a distance of no more than three (3) feet from the individual.

Q. What is the general principal of the SCSR?

A. Oxygen is supplied to the wearer and exhaled carbon dioxide is absorbed.

Q. May the SCSR be used to fight mine fires?

A. No, the SCSR is to be used for escape only.

Q. Why are goggles provided with the SCSR?

A. To provide eye protection from smoke and other harmful gases.

MANY ADVANCES HAVE BEEN MADE IN THE MINING INDUSTRY. SELF CONTAINED SELF RESCUERS, COMMUNICATIONS, TRACKING AS WELL AS REFUGE ALTERNATIVES. IT IS IMPORTANT TO BE WELL TRAINED ON ALL OF THESE TO BE AS SAFE AS YOU CAN BE.

ADMINISTRATIVE

Q. Who has the responsibility for the enforcement of all state laws and regulations relating to the safety of those employed in and around underground mines?

A. The West Virginia Office of Miners' Health, Safety and Training.

Q. Who has the authority to visit, enter, and examine any mine?

A. The Director of the West Virginia Office of Miners' Health, Safety and Training has the authority to visit, enter, and examine any mine whether underground or surface and may call for the assistance of any district mine inspector or inspectors whenever such assistance is necessary in the examination of any mine.

Q. Who shall furnish the Director of the West Virginia Office of Miners' Health, Safety and Training or mine inspector proper facilities for entering the mine and making examination or obtaining information?

A. The operator of every coal mine.

Q. Who may request the Director to have an immediate investigation made when it is believed that dangerous conditions are existing or that the law is not being complied with?

A. The miners at any mine or one of their authorized representatives.

Q. Why do mine inspectors make personal examination of each mining operation?

A. To determine whether a danger described in West Virginia Code exists or whether any provisions of State Mine Law is being violated or has been violated within the past forty-eight (48) hours.

Q. What must a mine inspector do when he finds a violation?

A. It shall be the duty of each inspector to note each violation he finds and issue a finding, order, or notice as appropriate for each violation noted.

Q. Who shall visit the scene of each fatal accident occurring at any mine?

A. The mine inspector.

Q. Who shall be given an opportunity to accompany the mine inspector during any inspection of a coal mine?

A. The authorized representative of the miners at the mine.

Q. What shall an authorized representative of the Director (mine inspector) do if an imminent danger is found to exist during any inspection of a coal mine?

A. Determine the area throughout which the danger exists and issue an order.

Q. What is the operator of the mine or his agent required to do when a mine inspector issues an order?

A. Immediately cause all persons except those referred to in West Virginia Mine Law to be withdrawn from and to be prohibited from entering such area.

Q. How long shall persons be withdrawn from and prohibited from entering areas subject to an order?

A. Until an authorized representative of the Director (mine inspector) determines that such imminent danger no longer exists.

Q. What shall an authorized representative of the Director (mine inspector) do when it is found the period of time for abatement of a violation has expired, the violation has not been totally abated, and the period of time should not be further extended?

A. Find the extent of the area affected by the violation and promptly issue an order.

Q. What persons shall not be required to be withdrawn from or prohibited from entering any area of a coal mine subject to an order issued by a mine inspector?

A. (a) Any person whose presence in such area is necessary to eliminate the condition described in the order; (b) any public official whose official duties require them to enter the area; (c) any representative of the miners in such mine who is qualified to make coal mine examinations, or who is accompanied by such person and whose presence is necessary for the investigation of the conditions described in the order; and (d) any consultant to any of the foregoing.

Q. What action may the Director take whenever the operator or his agent (a) violates or fails or refuses to comply with any order or decision issued under West Virginia Mine Law, or (b) interferes with, hinders or delays the Director or his authorized representative in carrying out the provisions of West Virginia Mine Law, or (c) refuses to admit such representatives to the mine, or (d) refuses to furnish any information or report requested by the Director in furtherance of the provisions of West Virginia Mine Law, or (e) refuses to permit access to, and copying of, such records as the Director determines necessary in carrying out the provisions of West Virginia Mine Law?

A. The Director may institute a civil action for relief including a permanent or temporary injunction, restraining order, or any other appropriate order in the circuit court of the county in which the mine is located, or the Circuit Court of Kanawha County.

Q. What is the civil penalty that shall be assessed any operator of a coal mine in which a violation occurs of any health or safety rule or regulation, or who violates any other provision of West Virginia Mine Law?

A. The penalty shall not be more than three thousand dollars (\$3,000) for each violation, unless the violation is classified as a "knowing" violation.

Q. What is the civil penalty that shall be assessed any miner who knowingly violates any health or safety rule or regulation?

A. They shall be subject to a penalty of not more than two hundred-fifty dollars (\$250) for each occurrence of such violation.

Q. What is the civil penalty that shall be assessed any operator who knowingly violates a health or safety provision or rule, or knowingly violates or fails or refuses to comply with any order issued pursuant to West Virginia Mine Law?

A. The penalty shall not be more that five thousand dollars (\$5,000) and for a second or subsequent violation assessed a civil penalty of not more than ten thousand dollars (\$10,000).

Q. What is the penalty for whoever knowingly makes any false statement, representation, or certification in any application, record, plan, or other document filed or required to be maintained pursuant to West Virginia Mine Law?

A. They shall be guilty of a misdemeanor and upon conviction shall be fined not more than five thousand dollars (\$5,000) or imprisoned in the county jail not more than six (6) months, or both fined and imprisoned.

Q. For what reasons shall no person discharge or in any other way discriminate against or cause to be discharged or discriminated against any miner or any authorized representative of miners?

A. If it is believed or known that such miner or representative (a) has notified the Director, his authorized representative, or an operator, directly or indirectly, of any alleged violation or danger, (b) has filed, instituted, or caused to be filed or instituted any proceeding under West Virginia Mine Law, or (c) has testified or is about to testify in any proceeding resulting from the administration or enforcement of the provisions of West Virginia Mine Law.

Q. Who may a mine inspector or the Director charge with neglect or failure to perform any duty mandated pursuant to West Virginia Mine Law?

A. A mine foreman, assistant mine foreman, or any other certified person.

Q. What is the penalty when it is found at the conclusion of a hearing that the charged person has neglected or failed to perform any duty mandated pursuant to West Virginia Mine Law?

A. Their certificate or certificates may be suspended or revoked.

Q. Can any person whose license or certificate has been suspended or revoked in another state be certified under any provision of West Virginia Mine Law?

A. No, they cannot be certified during the period of time of such suspension or revocation in the other state.

PRACTICAL

EXAMPLES

ANEMOMETER READING PRACTICE

The following page shows examples of anemometer readings. Look carefully at each anemometer face example and record below the anemometer reading for each example.

1. _____

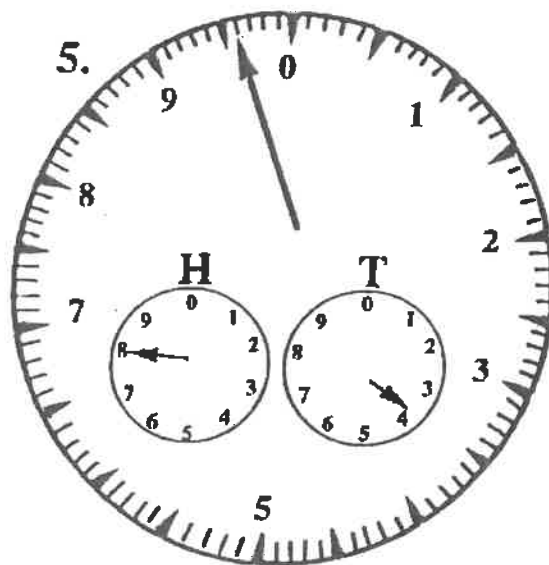
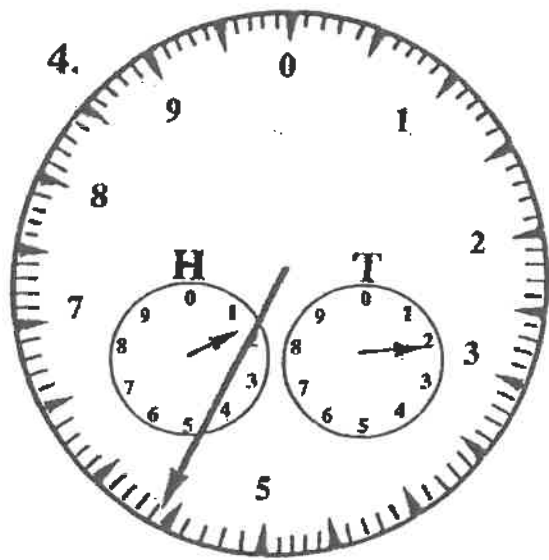
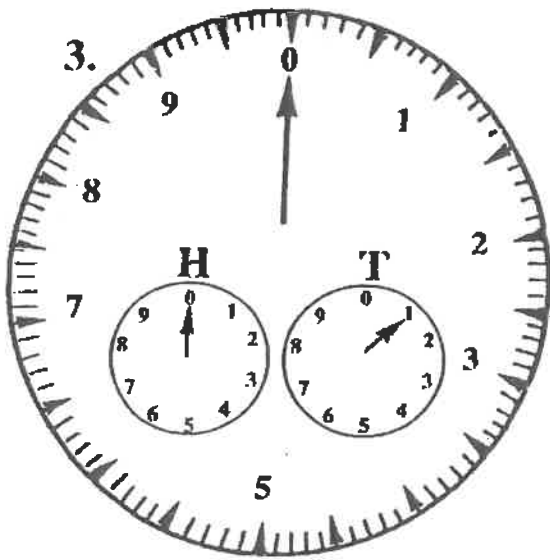
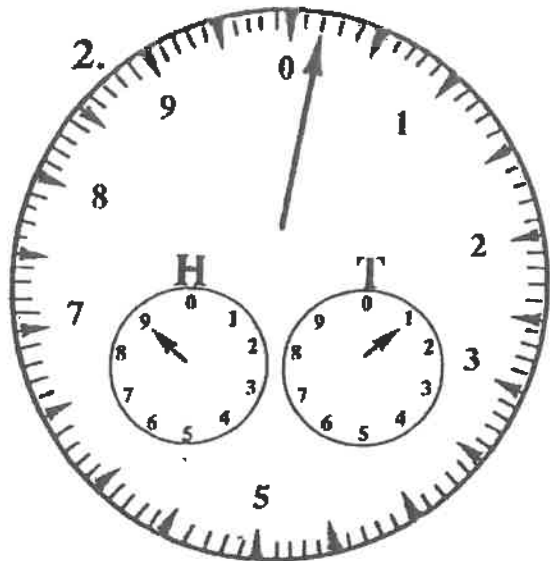
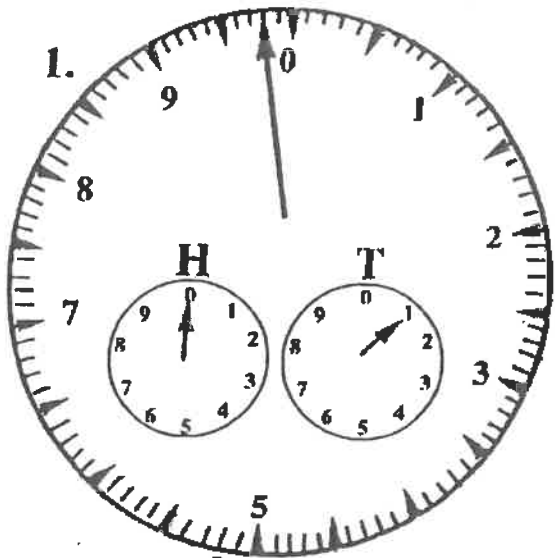
2. _____

3. _____

4. _____

5. _____

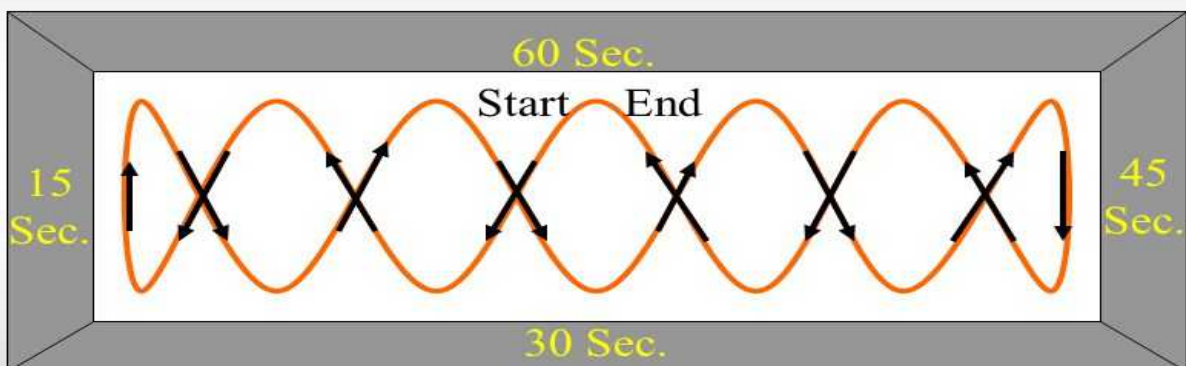
The correct readings can be found on the page following the next page.



ANEMOMETER READING PRACTICE

1. 998
2. 902
3. 1000
4. 2156
5. 3796

Traverse the whole entry when taking an anemometer reading.



EQUIPMENT FOR SMOKE TUBE READINGS:

SMOKE TUBES, ASPIRATION BULB, TUBE TIP BREAKER, STOPWATCH, TAPE MEASURE, CALCULATOR, PEN AND PAPER

COMPLETE SCENARIO:

FOR AREA OF ENTRY

TAKE HEIGHT MEASUREMENT - EXAMPLE: **6 FEET**

TAKE WIDTH MEASUREMENT - EXAMPLE: **19 FEET**

6 x 19 = 114 SQUARE FEET

FOR VELOCITY

TAKE A TIMED SMOKE CLOUD READING FOR A DISTANCE OF 10 FEET. EXAMPLE: **8 SECONDS**

YOU WILL NEED TO DIVIDE YOUR DISTANCE (10 FEET) BY YOUR AVERAGE READING **10 FEET DIVIDED BY 8 SECONDS = 1.25 SECONDS**

MULTIPLY THAT BY 60 TO GET MINUTES: **1.25 FPS (SECONDS) x 60 = 75 FPM (MINUTES)**

YOUR QUANTITY (CFM) IS NOW CALCULATED BY MULTIPLYING YOUR AREA (114 SQUARE FEET) BY YOUR FPM (75).

A x V = Q 114 x 75 = **8550 CFM (CUBIC FEET per MINUTE)**

Smoke Tube Data Converted To Velocity (FPM)

Velocity = Distance (Ft.) / Time (Sec.) X 60 X 0.9 From Bulletin 589

MSHA

Time Sec.	Velocity - FPM				Time Sec.	Velocity - FPM				Time Sec.	Velocity - FPM			
	5 Ft.	10 Ft.	15 Ft.	20 Ft.		5 Ft.	10 Ft.	15 Ft.	20 Ft.		5 Ft.	10 Ft.	15 Ft.	20 Ft.
5.0	54	108	162	216	15.5	17	35	52	70	26.0	10	21	31	42
5.5	49	98	147	196	16.0	17	34	51	68	26.5	10	20	31	41
6.0	45	90	135	180	16.5	16	33	49	65	27.0	10	20	30	40
6.5	42	83	125	166	17.0	16	32	48	64	27.5	10	20	29	39
7.0	39	77	116	154	17.5	15	31	46	62	28.0	10	19	29	39
7.5	36	72	108	144	18.0	15	30	45	60	28.5	9	19	28	38
8.0	34	68	101	135	18.5	15	29	44	58	29.0	9	19	28	37
8.5	32	64	95	127	19.0	14	28	43	57	29.5	9	18	27	37
9.0	30	60	90	120	19.5	14	28	42	55	30.0	9	18	27	36
9.5	28	57	85	114	20.0	14	27	41	54	30.5	9	18	27	35
10.0	27	54	81	108	20.5	13	26	40	53	31.0	9	17	26	35
10.5	26	51	77	103	21.0	13	26	39	51	31.5	9	17	26	34
11.0	25	49	74	98	21.5	13	25	38	50	32.0	8	17	25	34
11.5	23	47	70	94	22.0	12	25	37	49	32.5	8	17	25	33
12.0	23	45	68	90	22.5	12	24	36	48	33.0	8	16	25	33
12.5	22	43	65	86	23.0	12	23	35	47	33.5	8	16	24	32
13.0	21	42	62	83	23.5	11	23	34	46	34.0	8	16	24	32
13.5	20	40	60	80	24.0	11	23	34	45	34.5	8	16	23	31
14.0	19	39	58	77	24.5	11	22	33	44	35.0	8	15	23	31
14.5	19	37	56	74	25.0	11	22	32	43	35.5	8	15	23	30
15.0	18	36	54	72	25.5	11	21	32	42	36.0	8	15	23	30

BELT EXAMINERS SCENARIO

You are the certified belt examiner for the 1 North and the 2 East belt conveyors. You are to perform a preshift examination of these belts for the day shift production crew. The day shift begins at 8:00 a.m. and ends at 4:00 p.m.

While examining these belts, you find three (3) reportable hazards and/or violations on each belt. Those reportable hazards and/or violations are listed below. You must phone this report outside.

1 North Belt

1. Excessive coal dust at the belt head
2. Excessive coal spillage at #30 stopping
3. Unsupported brow at left side of tailpiece

2 East

1. Three (3) frozen bottom rollers at # 65 stopping
2. Water accumulation at # 80 stopping
3. Guard off at drive of belt head

You are to remain and work on this belt after completing your preshift examination. In addition, you are to perform an onshift examination of this belt for the day shift and correct any hazards and/or violations carried over from the preshift examination.

Record the examinations in the appropriate book.

Use Indelible
Pencil or Ink

PRESHIFT-MINE EXAMINER'S REPORT

Report shall be
signed when made

Date of Examination July 1 20 19 Section or Area Examined 1 North and 2 East Belts
 Time of Examination: from 5:30 a.m. or p.m. to 7:30 a.m. or p.m.
 Was this report phoned to outside: Yes no
 By whom Ben Good Time 7:45 A.M. _____ P.M.
 Report received by Jane Jones
 (Signed)

Violations and other Hazardous Conditions Observed and Reported

Location	Violation or Hazardous Condition	Action Taken
1. <u>1 North Belt Head</u>	<u>Coal Dust Accumulation</u>	<u>Reported</u>
2. <u>1 North No. 30 Stopping</u>	<u>Coal Spillage</u>	<u>Reported</u>
3. <u>1 North Tailpiece - Left Side</u>	<u>Unsupported Brow</u>	<u>Dangered Off</u>
4. _____	_____	_____
5. <u>2 East Belt Head</u>	<u>Guard off at drive</u>	<u>Replaced Guard</u>
6. <u>2 East No. 65 Stopping</u>	<u>Three frozen bottom rollers</u>	<u>Reported</u>
7. <u>2 East No. 80 Stopping</u>	<u>Water Accumulation</u>	<u>Reported</u>
8. _____	_____	_____
9. _____	_____	_____
10. _____	_____	_____

Air Measurements

Location	CFM	Location	CFM
<u>1 North Belt Head</u>	<u>Movement</u>	_____	_____
<u>2 East Belt Head</u>	<u>Movement</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Remarks: Areas safe to travel No CH4 detected

This is to certify that: (a) This section of the mine was properly examined by me, (b) all violations of the W. Va. Mining Laws and the Federal Coal Mine Health and Safety Act of 1969 and other unsatisfactory conditions and practices observed by me are listed in this report.

Signed By Ben Good 00000 _____
 Preshift-Mine Examiner Certificate No. Assistant Foreman Certificate No.
 Countersigned _____
 Mine Manager Mine Foreman _____
 Assistant Foreman _____
 Superintendent or Assistant _____

**DAILY AND ONSHIFT REPORT
MINE FOREMAN OR ASSISTANT**

Date July 1, 2019 Shift _____ Day _____ Area or Section 1 North and 2 East Belts

Violations and other Hazardous Conditions Observed and Reported

Location	Violation or Hazardous Condition	Action Taken
1. <u>1 North Belt Head</u>	<u>Coal Dust Accumulation</u>	<u>Cleaned and Rock Dusted/Corrected</u>
2. <u>1 North No. 30 Stopping</u>	<u>Coal Spillage</u>	<u>Cleaned and Rock Dusted/Corrected</u>
3. <u>1 North Tailpiece - Left Side</u>	<u>Unsupported Brow</u>	<u>Supported/Corrected</u>
4. _____	_____	_____
5. <u>2 East No. 65 Stopping</u>	<u>Three frozen bottom rollers</u>	<u>Rollers replaced/Corrected</u>
6. <u>2 East No. 80 Stopping</u>	<u>Water Accumulation</u>	<u>Pumped Water/Corrected</u>
7. _____	_____	_____
8. _____	_____	_____
9. _____	_____	_____
10. _____	_____	_____

Examinations for Methane in Working Places

Location	Time	Methane Content	Location	Time	Methane Content
1. <u>1 North Belt Head</u>	<u>2:30 pm</u>	<u>0.0 %</u>	11. _____	_____	_____
2. <u>2 East Belt Head</u>	<u>3:30 pm</u>	<u>0.0 %</u>	12. _____	_____	_____
3. _____	_____	_____	13. _____	_____	_____
4. _____	_____	_____	14. _____	_____	_____
5. _____	_____	_____	15. _____	_____	_____
6. _____	_____	_____	16. _____	_____	_____
7. _____	_____	_____	17. _____	_____	_____
8. _____	_____	_____	18. _____	_____	_____
9. _____	_____	_____	19. _____	_____	_____
10. _____	_____	_____	20. _____	_____	_____

Examinations for Methane in Return Aircourses

Location	Time	Methane Content	Location	Time	Methane Content
1. <u>N/A</u>	_____	_____	6. _____	_____	_____
2. _____	_____	_____	7. _____	_____	_____
3. _____	_____	_____	8. _____	_____	_____
4. _____	_____	_____	9. _____	_____	_____
5. _____	_____	_____	10. _____	_____	_____

Number of Bolts Tested N/A

Number of Bolts Torqued Above Range N/A Below Range _____

If majority of bolts tested in any working place falls outside approved torque range, state what action was taken _____

Remarks (Statement as to General Conditions of Mine or Area of Mine) Areas safe to travel No CH4 detected

Air moving in proper direction.

Ben Good
Assistant Mine Foreman

00000
Certificate No.

Mine Foreman-Mine Manager

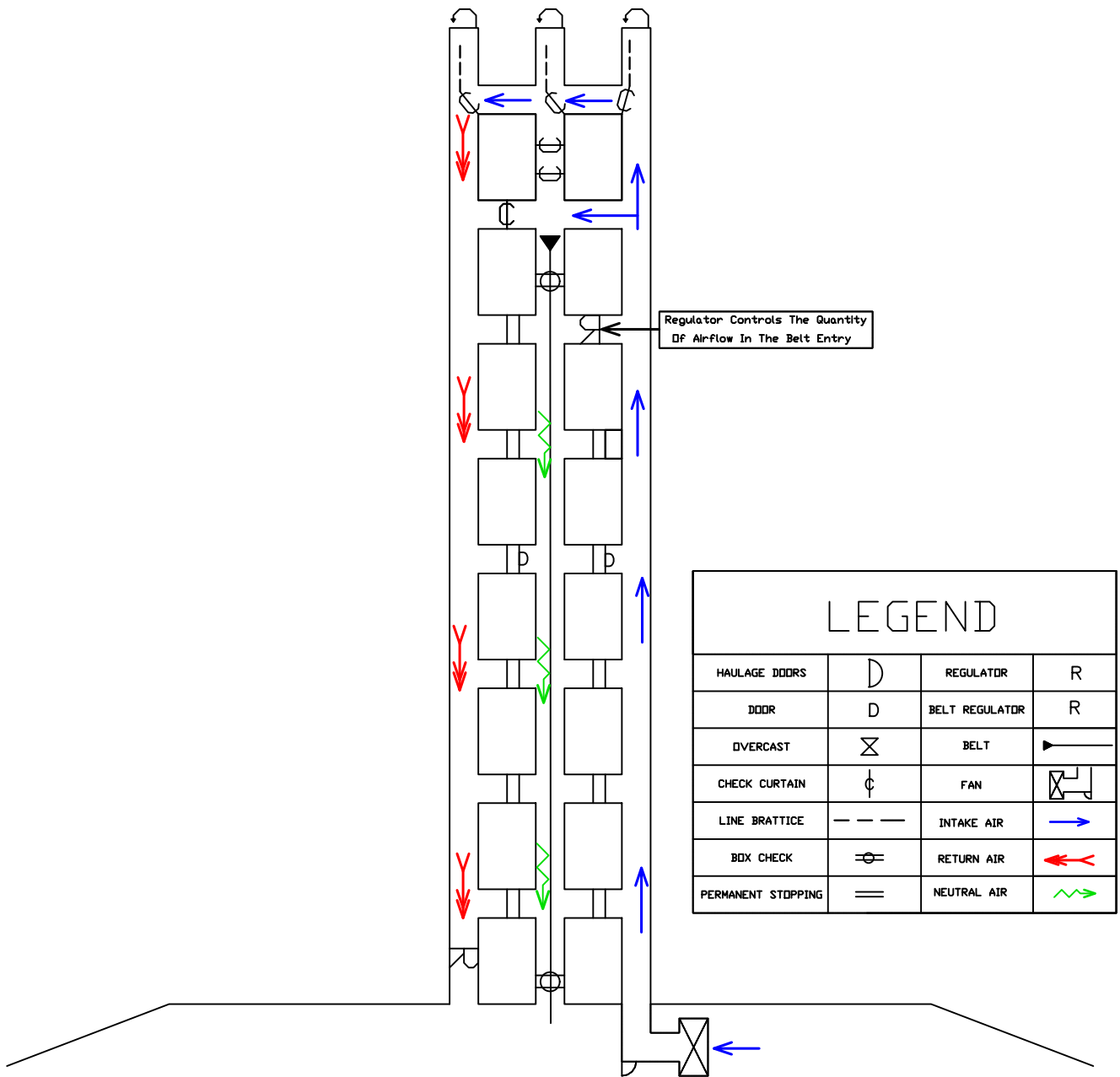
Certificate No.

Superintendent or Assistant

Belt Ventilation Example

Blowing Fan

Outby Belt Air



Regulator Controls The Quantity Of Airflow In The Belt Entry

LEGEND			
HAULAGE DOORS	D	REGULATOR	R
DOOR	D	BELT REGULATOR	R
OVERCAST	X	BELT	←
CHECK CURTAIN	φ	FAN	⊠
LINE BRATTICE	- - -	INTAKE AIR	→
BOX CHECK	⊖	RETURN AIR	←
PERMANENT STOPPING	=	NEUTRAL AIR	~

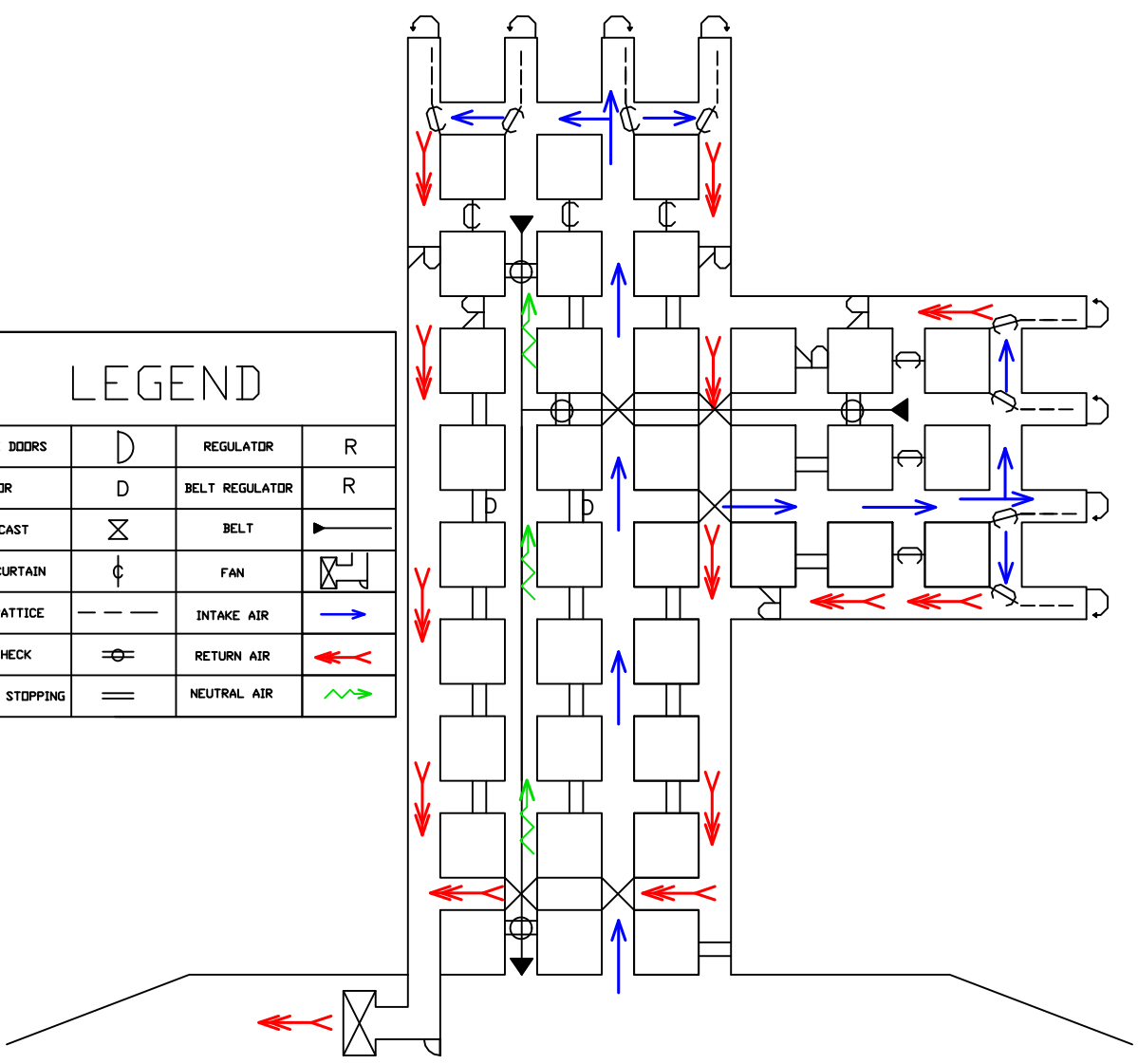
Blowing Fan Creating High Pressure in the Intake Entry

Belt Ventilation Example

Exhausting Fan

Inby Belt Air

LEGEND			
HAULAGE DOORS	D	REGULATOR	R
DOOR	D	BELT REGULATOR	R
OVERCAST	⊗	BELT	▶
CHECK CURTAIN	⊕	FAN	⊠
LINE BRATTICE	- - -	INTAKE AIR	→
BOX CHECK	⊖	RETURN AIR	←
PERMANENT STOPPING	≡	NEUTRAL AIR	↔

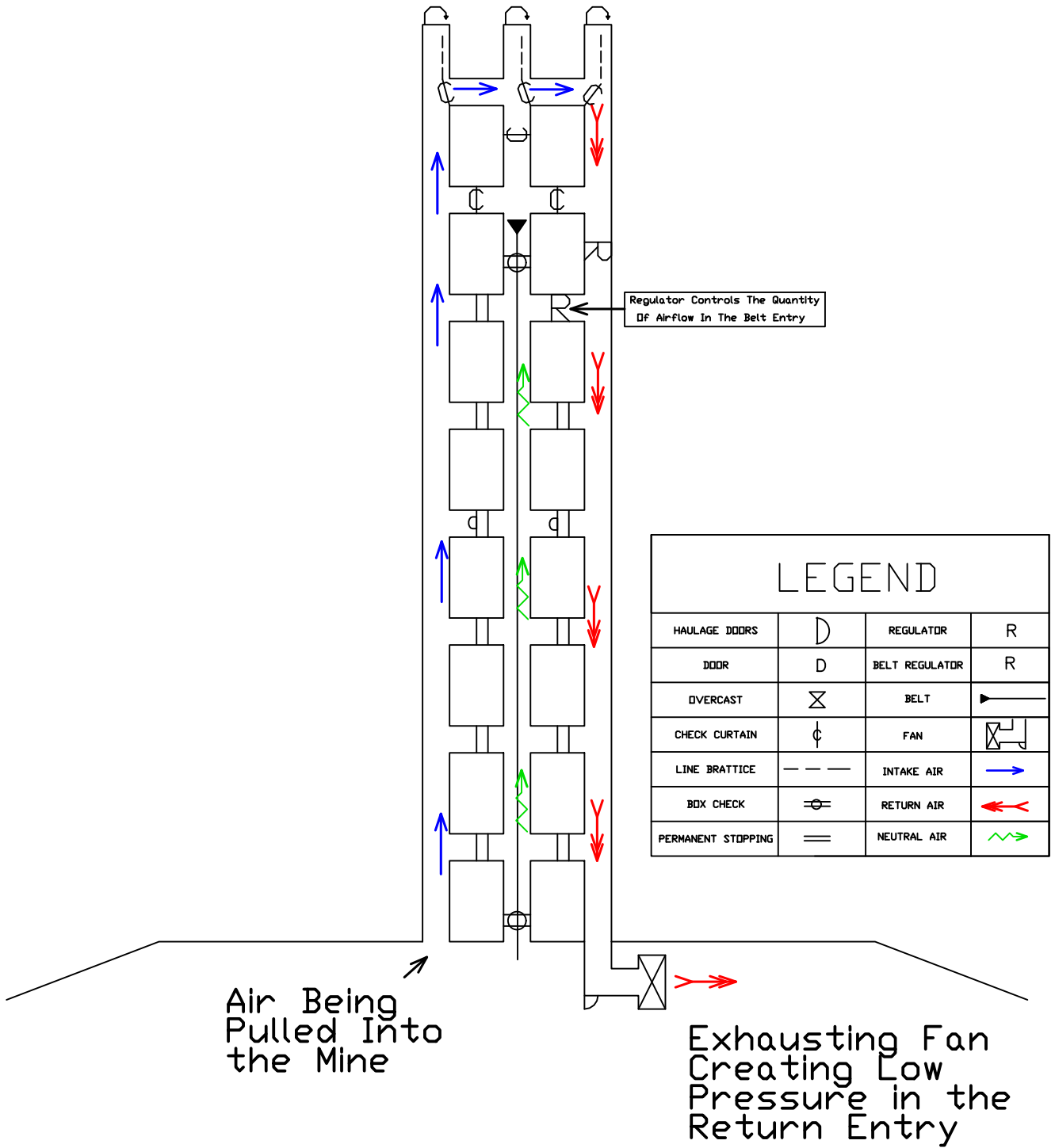


Air Pressure Entering the Mine is Higher Than Pressure in the Return Entry

Belt Ventilation Example

Exhausting Fan

Inby Belt Air



Belt Ventilation Example

Exhausting Fan

Outby Belt Air

