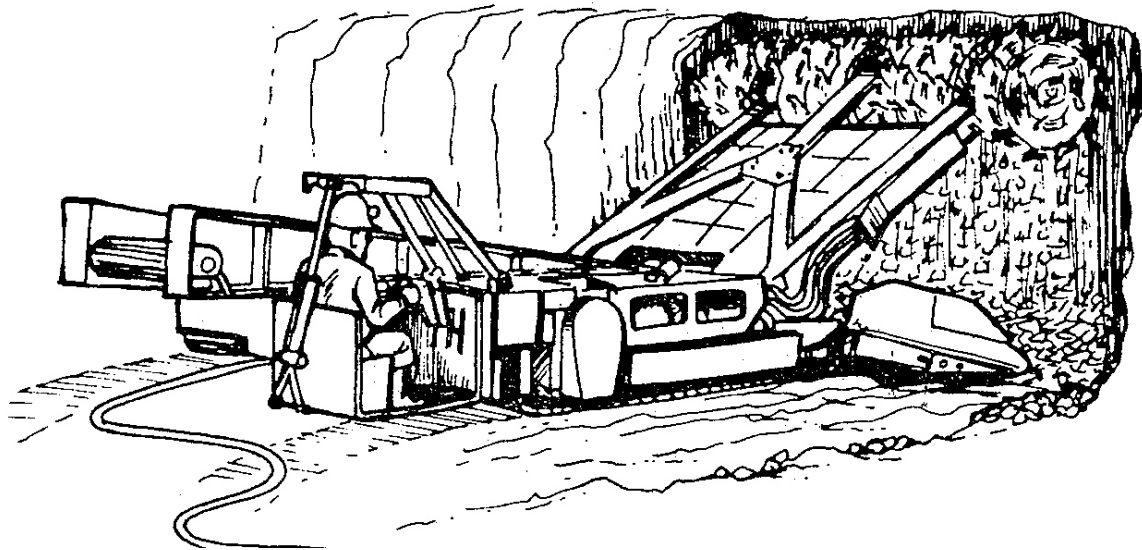


**WEST VIRGINIA OFFICE OF MINERS'
HEALTH, SAFETY AND TRAINING**

**80 HOUR Underground Miner Pre-Employment
Training Program Study Guide**



PRELIMINARY COURSE INFORMATION

Intoxicants are not allowed on or within any underground operation

There will be no smoking in any underground coal mine

Apprenticeship requirements:

- A. Completion of a eighty (80) hours course of instruction in underground mining.
- B. Satisfactory completion of an examination by the West Virginia Office of Miners' Health, Safety and Training.

Underground Coal Miner Certification Requirements:

- A. At least six (6) months experience with a minimum of 108 days plus.
- B. Successful completion of an examination conducted by the West Virginia Office of Miners' Health, Safety and Training with a minimum score.

Penalties for Health and Safety Violations:

- A. Individual miner can be fined as much as two hundred and fifty dollars (\$250 00) (This is referred to as an "IPA" Individual Personal Assessment.
- B. Mine owner or operator may be fined as much as three thousand dollars (\$3,000 00).

Inspection of Coal Mines:

- A. State and Federal inspectors can inspect mine operations at any time without prior warning to the mine operator
- B. Company officials and authorized representatives of the mines have the right to inspect for possible hazards or dangers

Employment Regulations for Apprentice Miners:

- A. An apprentice must wear a red hat for six (6) months
- B. Must be under the immediate supervision of a certified miner or foreman
- C. Know who their supervisors are at all times.
- D. A certified miner (black hat) can have one (1) red hat under his/her supervision at any one time
- E. A foreman can supervise as many as five (5) apprentice miners

Unit 1

Three Types of Underground Coal Mines:

- (1) Shaft mines - Opening goes straight down to the coal seam.
- (2) Drift mines - Opening goes directly back into the seam of coal where the coal has outcropped.
- (3) Slope mines - Opening slants down to the coal seam.

Note: Once you reach the seam of coal the mining methods are the same.

Mining Methods:

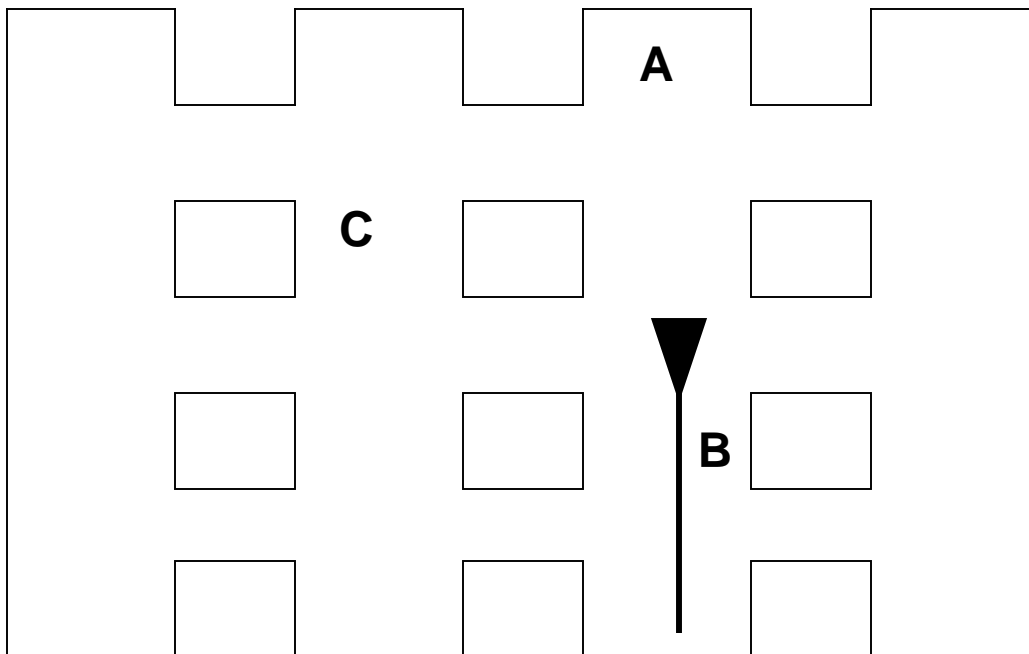
- A. Continuous - A section where a continuous miner is being used to remove the coal.
- B. Conventional - At least five (5) faces must be provided and the coal has to be blasted loose from a solid face.
- C. Longwall - Sheer or plow is used to mine a block of coal usually with a four hundred to six hundred (400 – 600) feet face (Or more) four thousand to six thousand (4,000 – 6,000) feet long; roof is supported by chocks.
- D. Bridgeway - Where an extensible belt is connected to the continuous miner and belt transports coal to the main section belt; the extensible belt replaces shuttle car coal transportation.
- E. Shortwall - Using a continuous miner to extract blocks of coal with chocks as the main means of supporting the roof.

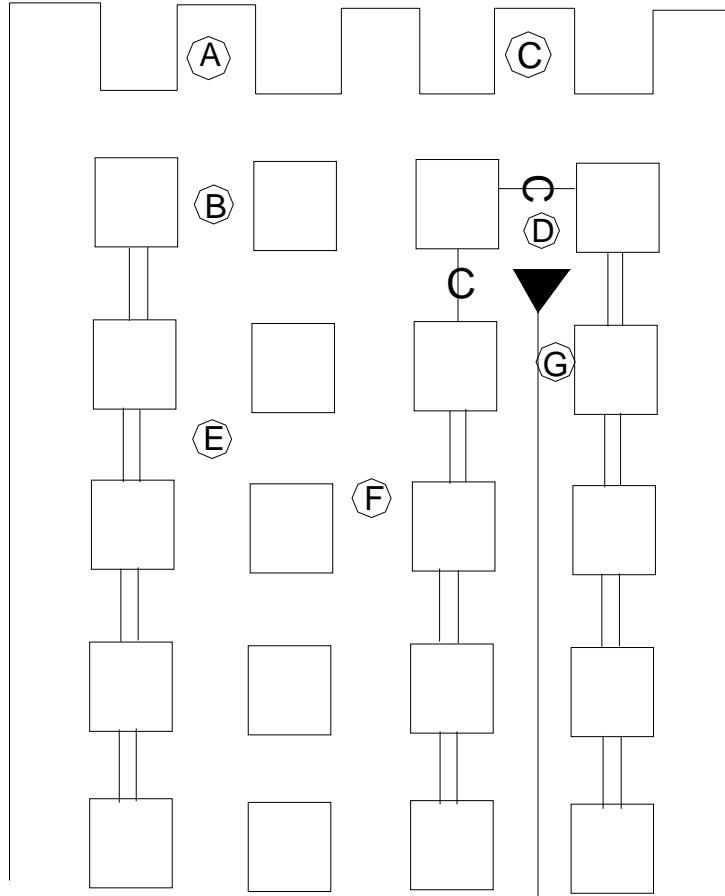
Definitions:

- Inby - This means closer to the face than a comparing point.
Outby - This means further away from the face than a comparing point.

Note: Usually the end of the belt or the last open crosscut will be used as comparing points.

Example:





Belt



Elevator Shaft

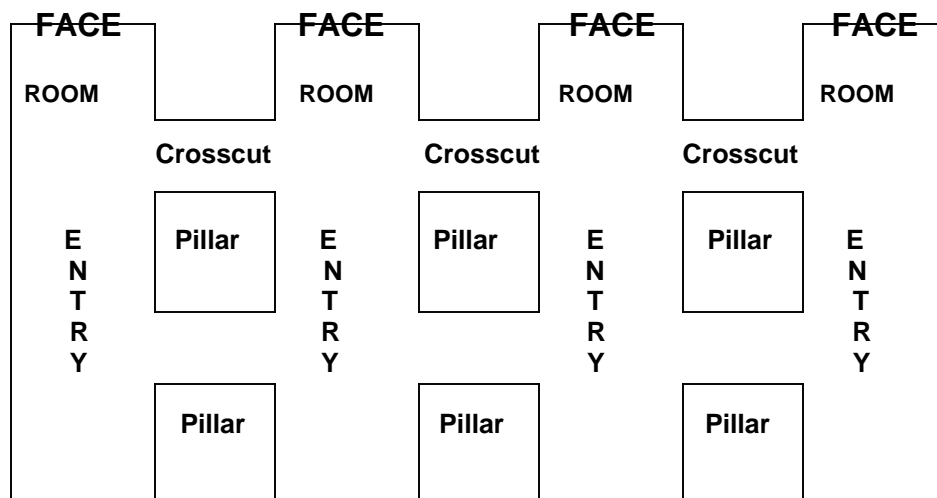
Point A is inby the last open crosscut because it is closer to the face than the last open crosscut.

Point B is outby the end of the belt because it is father away from the face than the end of the belt.

Point C is outby the last open crosscut because it is further away from the face than the last open crosscut, but inby the end of the belt because it is closer to the end of the belt.

Mining Terms:

- A. Crosscut - Passageways used to connect entries.
- B. Entry - Passageways leading to the face.
- C. Face - Actual place where coal is being removed.
- D. Gob - Caved in area in the mine usually after pillars have been removed.
- E. High coal - According to this material, anything over 36 inches is high coal. NOTE: Most coal miners consider high coal anything over four (4) feet.
- F. Low coal - Thirty-six (36) inches and lower according to this material.
- G. Pillar - Blocks or pillars of coal left behind in development mining supporting the main roof. These blocks are usually removed in retreat mining or pillaring allowing the roof to cave forming the gob.
- H. Portal - The opening of a shaft, drift, or slope mine.
NOTE: Sometimes the opening to a drift mine is called a driftmouth.
- I. Pillaring - (Retreat mining) Removing the blocks or pillars of coal that were left during development mining work in which the roof falls to become the gob.
- J. Rib - The sides (walls) of an underground mine.
- K. Roof - (Top) The material overhead in an underground coal mine.
NOTE: There can be many kinds of roof in mines – some good, some bad.
- L. Room - The area from the last open crosscut to the face.
- M. Section - The place in a mine where an entire crew of men are working and mining coal.
NOTE: There are usually many sections in an underground mine depending on the size of the mine.



Note: Entries are numbered from left to right.

Note: This whole area would be called a section.

You need to know how to recognize all the mining machines.

Unit 2

Self Rescuer:

Two (2) models:

- A. M.S.A. W-65 is in a stainless steel case.
- B. Drager 810 is in a plastic carrying case. Both models function basically the same.

Important things to remember about the self rescuer:

- A. Issued by the company.
- B. Should be worn in the underground miners' belt at all times.
- C. Retraining classes in the use of the self rescuer must be conducted every year.
- D. Once the seal is broken it will give the wearer one (1) hour protection.
- E. Should be used at the first indication of smoke or fire.
- F. Principle purpose is to change carbon monoxide (CO) to carbon dioxide (CO₂).
- G. Provided the seal is not broken the belt life of carrying time is five (5) years.
- H. When in use mouth piece will heat up; under **no** circumstances should it be removed from your mouth.
- I. The M.S.A. W-65 can be checked for air tightness by submerging it in water; if air bubbles appear it should be exchanged for a new one. The Drager 810 should **NOT** be tested for air tightness by submerging it in water. **NOTE: These self rescuers have to be weighted every ninety (90) days, if they should gain more than ten (10) grams from their original weight, they have to be replaced.**

The student should know all the personal safety equipment necessary for entry into an underground mine.

Battery cap light check:

If the indicator or needle points to the ON position the battery is not charged and should not be taken underground. If the indicator points to the OFF position the battery is charged and ready for use.

Definition of Terms:

- A. Mine Emergency Plan - A plan of what those on the surface will do and what those underground will do in the event of an emergency.

Underground emergency plan:

- (1) Recognize the emergency exists.
- (2) Report nature and location of emergency.
- (3) Try to escape from dangerous area.
- (4) If escape is cut off then the final step is to barricade.
- B. Check –In, Check Out Procedure: A quick way to determine who is in the mine in the event of a mine emergency (time clock, lamp check, tag, etc.)

- C. Tram - The moving of self propelled equipment from one place to another other than track equipment.
- D. Dangerboard - A sign used to warn miners from entering dangerous areas in the mines; no one is allowed to cross a dangerboard unless accompanied by a foreman with the intent of correcting the dangerous condition.
- F. Shelterholes or Manholes - Places in the rib along track haulageways for workers to get when track equipment is moving along the track. Shelterholes are on the clearance side and spaced no farther than one hundred (100) feet apart.

Riding Mantrips:

Open Trips:

- A. Make sure trip is stopped before getting on and off.
- B. Board and ride on opposite side of the trolley wire.
- C. Face the direction of travel.
- D. Keep seated in bottom of car with all parts of body confined inside of car.
- E. Wear safety glasses.
- F. Never ride cars with any type of supplies, tools or coal in car.

Closed Trips:

- A. Make sure trip is stopped before getting on or off.
- B. Keep all parts of body inside of car.

Conveyor belts can be used as mantrips but are classified as open mantrips if they meet these requirements:

- A. Eighteen (18) inches of overhead clearance minimum.
- B. Automatic cut off switch for entire length of belt.
- C. Thirty-six (36) inches clearance at loading and unloading points with lighting provided.
- D. Men shall ride six (6) feet apart.
- E. Belt speed should not exceed two hundred fifty (250) feet per minute with eighteen (18) inches clearance. Three hundred (300) feet per minute with twenty-four (24) inches overhead clearance and three hundred fifty (350) feet per minute with more than twenty-four (24) inches of overhead clearance.
- F. Trip riders should lay flat on stomach with arms stretched out in front of them.
- G. Must wear safety glasses.
- H. Cross the belt only where suitable crossing facilities are provided.

Steps for Crossing the Tracks Safely:

- A. Walk on the clearance side.
- B. Look both ways for approaching trips.
- C. Watch footing to prevent slipping or tripping.
- D. Watch out for trolley wire.
- E. Cross where track is straight not on a curve.
- F. Do not step on the rails.

BASIC ELECTRICAL CONCEPT TRAINER

The Basic Electrical Concept (BEC) Trainer will allow the instructor to demonstrate the effect of an electrical circuit. He/she will be able to show the conductivity or insulating properties of material by placing them on the insulator/conductor bracket and observing the light. The term “ground” can be demonstrated by using the ground wire.

Parts List

1. Base board.
2. Battery [Two (2) required] six (6) volts.
3. Conductor/Insulator bracket.
4. Incandescent light holder and light.
5. Wire.
6. Battery bracket.
7. On/Off switch.
8. Ground wire.

Unit 5

Definition of These Terms:

- | | | | |
|----|----------------|---|--|
| A. | D.C. Power | - | Direct current, current that flows in one direction. |
| B. | A.C. Power | - | Alternating current, current that flows in opposite directions. |
| C. | Conductor | - | Anything that will carry an electric current.
Example: Metal, water, human body. |
| D. | Insulator | - | Anything that will not carry an electric current.
Example: Rubber, plastic, glass. |
| E. | Ground | - | A conducting connection between an electrical circuit and the earth. |
| F. | Transformer | - | An electrical device that steps up or steps down voltage. |
| G. | Rectifier | - | An electrical device that changes A.C. power to D.C. power. |
| H. | Trolley wire | - | Uninsulated copper wire that supplies D.C. power to track equipment. |
| I. | Bond | - | A copper wire welded on the rails where there is a joint in the track for the ground connection. |
| I. | Nip | - | |
| J. | | - | A means of tapping power from the trolley wire to other electrical machines. |
| K. | Nip Station | - | Where all the nips from a section attach to the trolley wire and supply D.C. power to section machines. |
| M. | Trailing Cable | - | The cable that brings power from the power source to the machine. |
| N. | Splice | - | A connection made where a cable has been broken or damaged. Two (2) types: (1) Permanent (2) Temporary
Note: A temporary splice can not remain in a cable for longer than twenty-four (24) hours. |
| O. | Tagging Out | - | This means labeling and locking trailing cables that should not be energized while equipment is being worked on. |

Safety Practices Around Power Centers:

- (1) All power centers (nip stations, transformers, distribution boxes, etc.) must be located in a dry, well rock-dusted, well secured roof area, with a fire extinguisher provided at their location.
- (2) A rubber mat should be provided where electrical connections are made for persons to stand on while making these connections.

Instructor should discuss damaged trailing cable conditions. (Example: Damaged insulation, completely broken cable, etc.)

Instructor should discuss ways to remove a person from contact with an electrical circuit both correct and incorrect way.

Unit 6

Five (5) basic types of accidents: (Instructor should give examples of each)

- | | | | |
|----|--------------------------------|---|---|
| A. | Struck by | - | These accidents involve the worker being hit by machinery or parts of machinery, roof and rib falls or basically any accident where the worker gets hit by something. |
| B. | Struck against | - | These accidents involve the worker him/herself hitting or walking into something.
Example: Worker hitting the trolley wire while shoveling the track. |
| C. | Caught between | - | Accidents where the worker is caught between something.
Example: Conveyor belt accident, boom swinging around and pinning a person against the rib by the boom. |
| D. | Strains or Sprain | - | Strain: Overstretching of a muscle or tendon, such as a twisted ankle.
Sprain: Twisting injury at a joint, such as a twisted ankle. |
| E. | Exposure to Harmful Conditions | - | These are accidents resulting from hazards such as oxygen deficiencies, smoke inhalation, etc. |

Lifting Procedures:

Six (6) steps for high coal:

- (1) One foot alongside one behind the object, shoulder width apart.
- (2) Keep back straight.
- (3) Tuck chin in.
- (4) Grip object with the whole hand, not just the fingers.
- (5) Tuck elbows in.
- (6) Keep body weight over the feet.

Eleven (11) steps for lifting in low coal:

- (1) Get a buddy to help.
- (2) Use mechanical aids if possible.
- (3) Keep knees apart.
- (4) Keep back straight.
- (5) Tuck chin in.
- (6) Grip object with whole hand, not just the fingers.
- (7) Tuck elbows in.
- (8) Keep body weight over knees.
- (9) Lift with upper legs and arm muscles.
- (10) Shift knees when turning.
- (11) Do not make sudden jerks.

Unit 8

- Definition of methane gas - A highly explosive gas found in underground coal mines that is released from the coal as coal is being mined.
NOTE: Methane is not poisonous.
- How is methane detected? Methane cannot be detected with your five (5) senses so we must rely on portable methane detectors and the flame safety lamp as a secondary source for detecting methane.
- How is methane removed? Methane gas is removed by directing ventilation or air to the face of the mine and this air blows the methane out of the mine. NOTE: This will become more clear in UNIT 10 Ventilation.
- Where is methane found? Methane is found in the seam of coal and according to federal and state mine agencies all coal mines are to be treated as gassy. Methane is usually found in the face where the coal is being mined thus releasing the methane gas and accumulating up close to the roof of the mines since methane is lighter than air.

What is considered a dangerous level of methane?

In an underground mine methane is considered dangerous when it reaches one percent (1%) or more because of the coal dust in the mine.

Methane is referred to often as a firedamp atmosphere.

What must be done when methane reaches one percent (1%) and one and one-half percent (1 1/2%)?

- A. 1% - Cut power to the machine and change ventilation.
- B. 1 1/2% - Cut power to entire section and evacuate persons from the danger area.

Students should be able to pick out those methane detectors that show dangerous concentration of methane. Remember 1% or more is considered dangerous.

Definition of These Terms:

- A. Carbon Monoxide (CO) - A highly poisonous gas that is found in an underground coal mine as a result of a fire or an explosion.
- B. Carbon Dioxide (CO₂) - An acid tasting gas that is sometimes used in fire extinguishers to help put out fires.
- C. Oxygen Deficiency - Lack of air in the mine when the oxygen content is less than 19.5%.
- D. Blackdamp - Any mine atmosphere (air) that will put out a flame.
- E. Firedamp - Any mine atmosphere (air) that will burn or explode.

Using a Flame Safety Lamp:

- A. Adjust your normal traveling flame on the outside.
- B. If flame gets longer this means methane gas is present.
- C. If flame gets shorter or goes out you are in an oxygen deficient atmosphere.

Where Methane and Oxygen Deficiencies Must be Checked:

- A. Methane gas must be checked up close to the roof since it is lighter than air.
- B. Oxygen deficiencies must be checked down close to the floor since most oxygen deficiencies are caused by too much carbon dioxide which is heavier than normal air.

Who Must Check for Methane Gas?

- A. All face equipment operators before energizing equipment and every twenty (20) minutes during operation.
- B. All equipment operators before tramming to a working face.
- C. Fireboss must check before every shift and section foreman must check before shift and once every two (2) hours during the shift.

Unit 9

Principle Causes of Mine Fires and Explosions:

- A. Open flame.
- B. Accumulation of coal dust.
- C. Electrical failure.
- D. Inadequately maintained equipment.
- E. Friction by conveyor belts.
- F. Improper blasting.

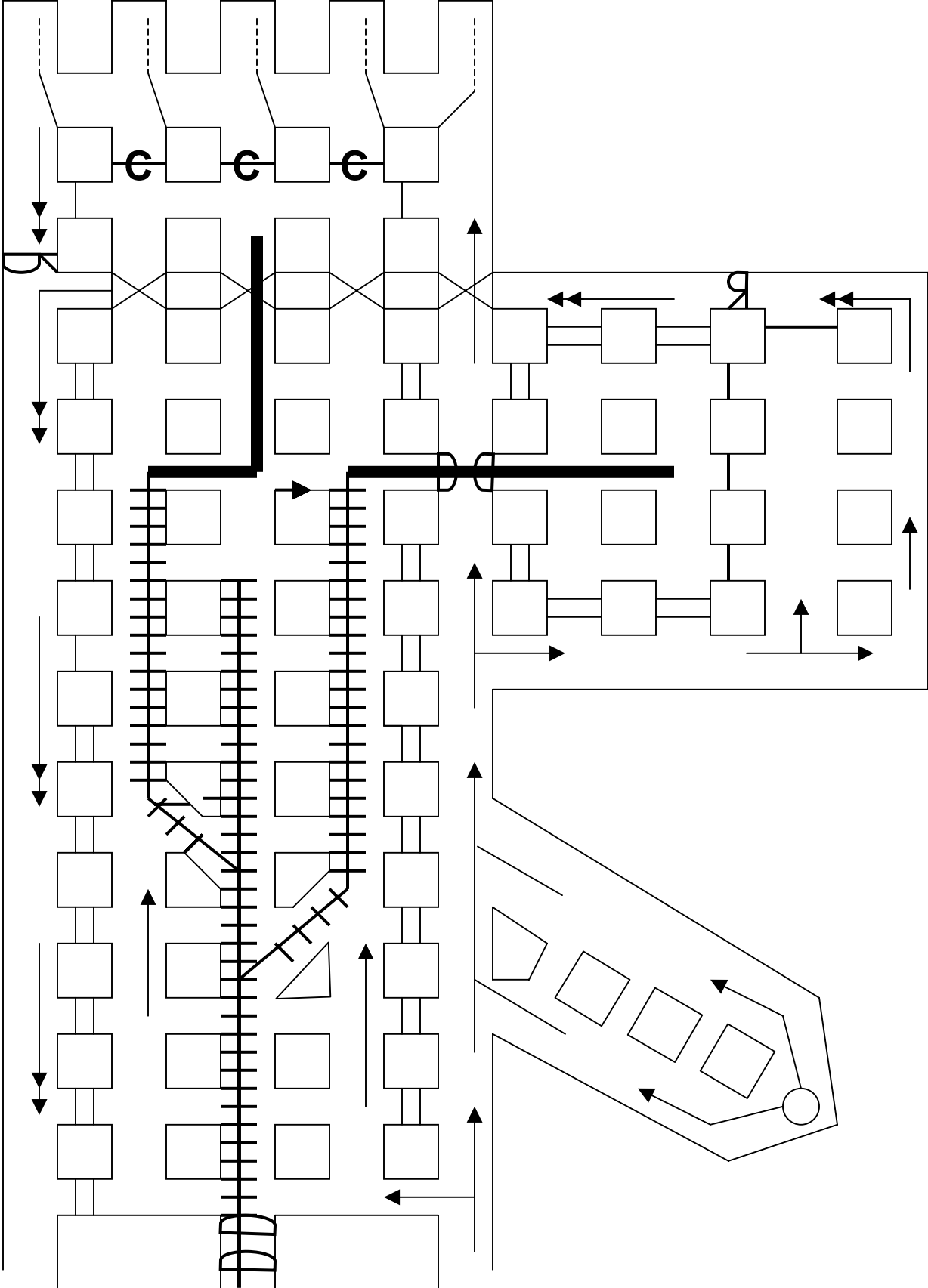
Potential Fuels:

Coal, coal dust, timbers, oil, grease, gas (methane), rubber belts, and plastics.

Location of Fire Fighting Equipment:

- A. Electrical switch point (power center).
- B. Oil storage areas.
- C. Haulage loading points.
- D. Areas where welding, cutting, or soldering takes place.
- E. Twenty-five (25) feet of wooden doors where power wires pass.
- F. All self-propelled equipment.
- G. At working face.
- H. Along belt conveyors.

Location of Fire Fighting Equipment



Principles of Fire Fighting:

- A. Giving alarms.
- B. Location of fire fighting equipment.
- C. Avoid smoke and burns.
- D. Recognize different types of fires and extinguishers.

Types of Fires:

- Class A: Solids
- Class B: Flammable liquids
- Class C: Electrical

How to Fight Fires:

- A. Direct water or chemical at base of fire.
- B. Use rapid sweeping motion starting at edge and moving inward.
- C. Keep outby fire so you can escape.
- D. Do not enter smoke filled areas unless you have a breathing tank and a safety line.

Rock Dusting:

- A. All areas of mine require rock dust within forty (40) feet of the face.
- B. Understand how rock dust extinguishes fires.
- C. Understand how rock dust prevents fires (by diluting).
- D. How to apply rock dust:
 - (1) Track rock dusters
 - (2) Portable section rock dusters.
 - (3) By hand.
- E. Percentages of rock dust:
 - (1) Sixty-five percent (65%) intake airways.
 - (2) Eighty percent (80%) return airways.

Unit 10

Two (2) Main Purposes of Ventilation:

- (1) Supply fresh air to underground workers. NOTE: Keep oxygen content at 19.5% to 21%.
- (2) Keep enough velocity of air to carry away harmful coal dust and keep methane gas below 1%.

Definition of Terms:

- A. Coal dust - Dust released as coal is being mined.
- B. Bug dust - Another name for coal dust which is heavy and accumulates along the floor and ribs of the mine.
- C. Float dust - Fine particles of coal dust that are kept in suspension by the ventilating current.
- D. Dilute - Mixing in of enough fresh air to keep methane and coal dust below harmful concentrations.

- E. Main fan - Surface fan responsible for ventilation underground mine.
- F. Blow fan - Type of main fan that pushes air through the mine.
- G. Exhaust fan - Type of main fan that pulls air through the mine.
- H. Intake - Entries used for bringing fresh air to the face.
- I. Return - Entries used for bringing bad air out of the mine.
- J. Air split - Where air separates from the main intake to supply ventilation to other parts of the mine.
- K. Stopping - Usually a cinder block wall built between entries to separate two different air currents.
- L. Check - A piece of brattice hung in an entry or crosscut which is used to deflect air to some other part of the section where it is needed.
- M. Line - A piece of brattice hung from the last crosscut and runs up to within ten (10) feet of the face which directs air up to the face.
- N. Overcast - A structure which allows two different air currents to cross without mixing in with each other
- O. Regulator - Devices in return airways that control air splits and according to what they are set at will control how much air comes onto a section.
- P. Anemometer - An instrument that measures air velocity (how fast the air is traveling cubic feet per minute).
- Q. Auxiliary ventilation and tubing - Small portable fans installed in the last open crosscut with tubing attached to fan where tubing is extended to within ten (10) feet of the face can be used with line curtain or can replace line curtain.
- R. Bleeder system - Entry left open around a job area to ventilate around and force air through the job.

Students should be able to recognize incorrect installed check and line curtain and related hazards. Check and line curtains should be installed to have minimized air leakage. Incorrect installation of check and line curtain allows the air to short circuit into the returns.

Four Steps for Hanging a Check Curtain:


- (1) Select a place suitable for travel.
- (2) Remove uneven ribs or protruding brows.
- (3) Remove any other loose objects.
- (4) Install to minimize leakage.

Incorrect installation of check curtains allows the air to short circuit into the returns.


Map Symbols:

Intake Air: 


Return Air: 


Permanent stopping: 

Air split: 

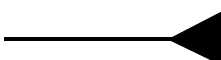
Check Curtain: 

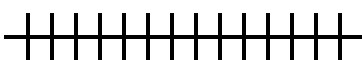
Door: 

Overcast: 

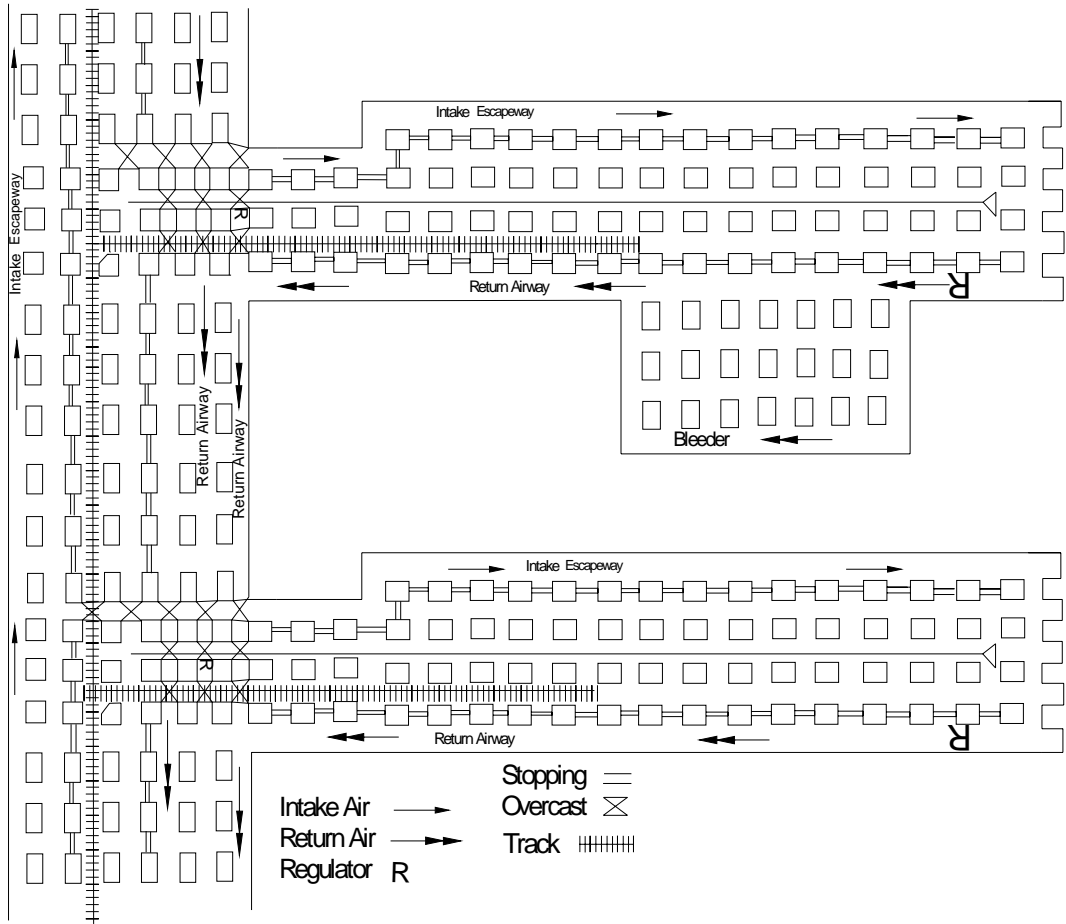
Regulator: 

Line curtain: 

Belt: 

Track: 

Remember: When trying to escape from the mine and your normal way is blocked you should if possible use the intake air escapeway.



Unit 12

Remember: Roof and rib falls is the leading cause of fatal accidents in underground mines.

Definition of Terms:

- | | | | |
|----|-----------------------------|---|---|
| A. | Roof control plan | - | A plan adopted by the company, approved by the West Virginia Office of Miners' Health, Safety and Training, of the mines showing the type of roof, the materials to be used in controlling the roof, the spacing between the support materials. This plan is to be reviewed every six (6) months. |
| B. | Roof bolt support system | - | Any place where roof bolts are utilized to support the mine roof. |
| C. | Conventional support system | - | Using anything other than roof bolts or chocks to control the mine roof. |
| D. | Roof bolt | - | A long steel rod inserted in the mine roof to help hold it in place. |
| E. | Expansion bolt | - | A type of roof bolt with an expandable shell on the end that when tightened expands and grips into the roof holding the bolt and roof in place. |
| F. | Resin bolt or glue bolt | - | After the hole is drilled in the mine roof a tube of glue is inserted in the hole then the resin bolt which punctures the tube of glue and allows the glue to spread in the cracks in the mine roof helping to bind or cement the layers in place. |

Two Principles of Roof Bolting:

- | | | |
|-----|-----------------|---|
| (1) | Beam building - | Bolting several weak layers to make one strong layer. |
| (2) | Suspension - | Hanging weak roof from strong roof overhead. |

Recognition of Hazardous Roof and Rib Conditions:

- | | | | |
|-----|---------------|-----|--|
| (1) | Slips | (5) | Clay veins |
| (2) | Rolls | (6) | Water dripping |
| (3) | Kettlebottoms | (7) | Coal spilling off from the ribs |
| (4) | Horsebacks | (8) | Audible sounds roof gives off when working |

Steps for Sounding Roof and Rib in Order:

- (1) Make a visual inspection first.
- (2) Stand under supported roof at all times.
- (3) Don't turn your back to the face or ribs.
- (4) Make sure of a safe line of retreat.
- (5) Wear your safety glasses.
- (6) Use a good testing tool.
- (7) Use your bare fingers with thumb pointed toward you.
- (8) Tap lightly then increase strokes.
- (9) Test roof, ribs and face.
- (10) Test only far enough to put up the next supports.
- (11) Test often while you are working in any place.

Remember when using a slate bar always pry up on the bar when removing loose particles.

Unit 13

Definitions of Terms:

A.	Backpoling	-	Trolley pole facing direction of travel.
B.	Clearance side	-	Opposite trolley wire on track haulage, twenty-four (24) inches between rib and furthest projection point of anything traveling the track.
C.	Dispatcher	-	Person who controls underground track traffic.
D.	Main line	-	Main track system in and out of the mine.
E.	Man hole (shelter hole)	-	Places on the clearance side rib for workers to get out of the way of equipment on track. Spaced not further than one hundred (100) feet apart.
F.	Tight side	-	Trolley wire side of the track haulage. Twelve (12) inches of clearance between rib and furthest projection point of anything traveling the track.
G.	Trip	-	(Supply trip – man trip – coal trip) Ways of moving things in and out of the mines.
H.	Trolley wire	-	Uninsulated copper wire that carries D.C. power to track equipment.

Warning Lights and Reflectors are Used to Warn:

- (1) Against low head clearances.
- (2) Mark or point out switches and their direction.

Major Operational Checks That Must Be Performed Before Track Equipment Can Be Operated:

- (1) Cable condition on trolley pole.
- (2) Lifting bar and jack.
- (3) Fire Extinguisher.
- (4) Sand box.
- (5) 2-way communication.
- (6) Warning devices.
- (7) Lights.
- (8) Brakes.

Pre-operational Checks On Face Equipment In Order Are:

- (1) Check roof and ribs in working area.
- (2) Make methane tests.
- (3) Check to make sure control switch is off.
- (4) Inspect trailing cable.
- (5) Be sure correct breaker switch is selected (correct plug).
- (6) Check free movement of controls.

Pre-operation Checks To Be Made Before Tramming To Face:

- (1) Check roof and ribs of working area.
- (2) Make methane test.
- (3) Frequently inspect trailing cable.

The correct way to cross a cable is to step on the cable unless it is at a splice (temporary or permanent).

Equipment booms must be supported when men are working under them (cribs support best).

Hazardous Haulage Roadways:

- (1) Muddy mine floor.
- (2) Ruts and holes in roadway.
- (3) Bad housekeeping.

Unit 14

Definition of Terms:

- | | | | |
|----|-----------------------|---|---|
| A. | Certified person | - | Take a training course, pass a test, and receive a card for the job. |
| B. | Qualified person | - | Just knowing how to do the job. |
| C. | Permissible equipment | - | Test by U.S.B.M. for safe use in underground coal mines. (United States Bureau of Mines - MSHA) |

Jobs that require special certification:

- A. Belt examiner
- B. Shot fireman
- C. Fireboss
- D. Electrician
- E. Section foreman
- F. Mine foreman

All other jobs require qualifications (machine jobs, ventilation jobs, etc.).

Employment regulations for apprentice or red hat miner:

- A. Completes 80 hour course and passed test.
- B. Must wear red hat for six (6) months.
- C. Must be within sight and sound of experienced miner.
- D. Restricted from running equipment for the first ninety (90) days.

Employment regulations for miners certificate:

- A. Must work at least six (6) months and more than 108 days underground.
- B. Must pass a test given by the West Virginia Office of Miners' Health, Safety and Training.

No smoking or smoking materials or alcoholic beverages are allowed in mines.

Penalties for willfully violating a health or safety standard for the miner:

One cent (\$0.01) to a maximum of two hundred fifty dollars (\$250.00)

Penalties for willfully violating a health or safety standard for the company or operator:

One cent (\$0.01) to three thousand dollars (\$3,000.00).

Fireboss must make pre-shift inspection before any men can enter the mine.

Four (4) places where 2-way communications must be located:

- (1) Every working section.
- (2) Automatic elevators.
- (3) All track haulage equipment.
- (4) Return air escapeways (every 4,000 feet).

Unit 17

Definition of Terms:

- | | | | |
|----|-----------------------|---|---|
| A. | Personal dust sampler | - | A device worn on a miners' coveralls to measure the amount of dust he/she breathes. |
| B. | Black lung | - | Breathing in and holding fine particles of coal dust in the lungs. |
| C. | Respirable dust | - | Fine particles of coal dust that is breathed into the lungs. |
| D. | Respirator | - | Device worn by a miner to filter dust out of the air in which they breathe. |
| E. | Ear protection | - | Devices worn by miners that go over or in the ears to protect against hearing loss. |
| F. | Port-a-potties | - | Toilet facilities underground. |

Black lung cannot be detected unless chest x-rays are made.

Dust suppression devices on machines (watersprays, etc.), dust respirator furnished by the company to protect workers from black lung.

Unit 19

- A. Proper tools for jobs and proper use of these tools.
- B. Recognizing defective tools (broken handles, mushroomed heads, etc.).
- C. Safety meetings, correct and incorrect.
- D. Asking questions when you don't know.

Unit 20

High Coal Hazards:

- A. Head clearance.
- B. Moving equipment.
- C. Trailing cables.
- D. Lifting.
- E. Blocked vision.
- F. Blocked line of retreat.

Safeguard Procedures in Wet Mines:

- A. Wear suitable clothing and rubber safety boots.
- B. Wear rubber insulated gloves.
- C. Wear knee pads in low coal.
- D. Kneel on rubber pads at power centers.
- E. Build ditches and use pipes and pumps to remove excess water from mine floor.
- F. Keep clothing, rubber gloves, and rubber boots in good condition.
- G. To be aware of where machines are tramming.
- H. Have a position for clear escape.

Good Housekeeping Practices:

- A. Bring only those tools necessary for your job.
- B. Keep haulage ways and passageways clear of supplies, loose coal and rock.
- C. Keep oily rags in closed containers.
- D. Keep all cap blocks, wedges, belts, empty oil cans and other debris removed from mines on a daily basis.
- E. Store supplies, tools and park machinery properly and do not leave cluttered passageways.

Steps for shoveling loose coal or rock from the rib:

- A. Check roof and rib conditions.
- B. Don't turn your back to the face or ribs.
- C. Watch for tramming equipment.
- D. Don't shovel under bare trolley wire.

Shoveling the belt:

- A. Use a shovel without a hole for a hand grip, use a straight handle shovel.
- B. Shovel coal onto the belt in the same direction the belt is moving.
- C. Keep clothing fitted snugly to prevent catching on the moving belt.
- D. Keep long hair confined.
- E. Stop the belt before shoveling from under it when it is possible.

Shoveling the tail piece:

- A. Make sure belt is off.
- B. Don't touch electric wires.
- C. Watch out for tramming shuttle cars.
- D. See that the guards on belts and pulleys are in place.
- E. Remove guards only on instruction of supervisor.

Signaling from behind barricade:

When you hear three (3) shots this means the mine rescue team is looking for you. You should pound the roof and ribs ten (10) times; rest fifteen (15) minutes and if you don't hear anything, pound hard 10 times again. Continue this pattern until you hear five (5) shots. This means you have been located and help is on the way.

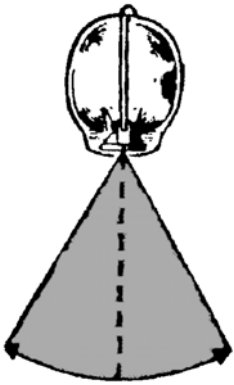
Four Basic Procedures For Blasting:

- (1) Only certified a "shot firers" are permitted to place explosives at the blast site and do the actual blasting.
- (2) Non-certified persons are permitted to transport explosives to the working section.
- (3) Do not enter an area after a blast until smoke and/or dust clears.
- (4) Stand clear when you hear the shot fireman giving the warning to blaster (fire – fire– fire).

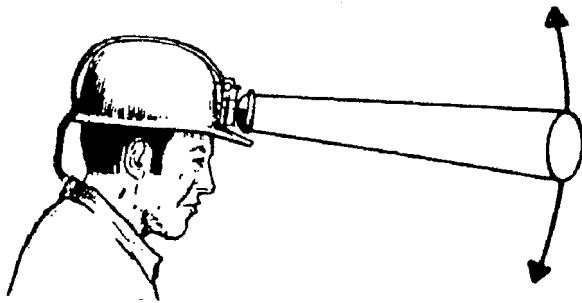
What To Do If You Find An Unsafe Condition:

- A. Report it to you supervisor.
- B. Correct it if possible.

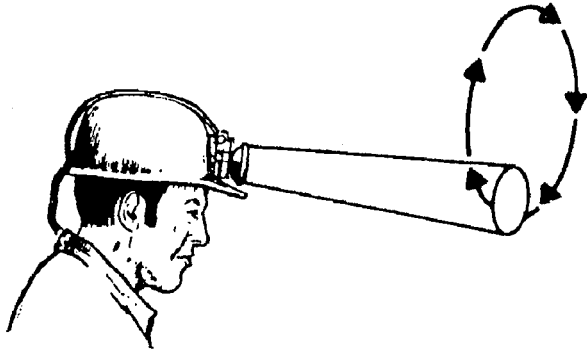
Cap light signals



Stop (No)



Yes (or go)



Come here
(or walk) (tram)



Move to sender's
right



Move to sender's
left

REVIEW FOR FIRST AID

Six Fundamentals of First Aid in Order:

- (1) Artificial Respiration
- (2) Control Bleeding
- (3) Treat for Physical Shock
- (4) Treat Wounds and Burns
- (5) Treat for Fractures and Dislocations
- (6) Transportation of Patient

Definitions:

First Aid - The emergency care for a person who is injured or sick, to relieve pain and prevent death.

Artificial Respiration - The breathing for a person whose normal breathing has slowed or stopped.

Four Types of Artificial Respiration:

- (1) Mouth to mouth (the best method)
- (2) Holger Nielson (back pressure arm lift)
- (3) Shaffer (prone or back pressure)
- (4) Sylvester

Steps for giving artificial respiration in order are:

- (1) Clear the air passage.
- (2) Lift up under neck, extend chin, pinch the nostrils together.
- (3) Inhale deeply, breathe into victims' mouth.
- (4) Remove mouth and listen for return airflow.

Causes for a person to lose his/her breathing:

- (1) Electric shock.
- (2) Drowning.
- (3) Suffocation.
- (4) Breathing poisonous gases (asphyxia).

Control of Bleeding:

Three types of blood vessels:

- (1) Arteries.
- (2) Veins.
- (3) Capillaries.

How to Recognize Bleeding:

Arteries - (Most serious bleeding) The blood spurts from the wound due to the beating or pulsating of the heart and the blood is bright red in color due to the oxygen in the blood. Arteries carry blood from the heart to various parts of the body.

Veins - The blood flows from the wound in a smooth steady stream and is dark red in color due to the carbon dioxide in the blood. Veins bring blood back to the heart and is under no pressure.

Capillaries - The blood just oozes from the wound and there is no great cause to be alarmed.

How to Control Bleeding:

Veins - In most cases direct pressure will stop venous bleeding. If it doesn't then a constricting bandage should be tied tightly in place below the wound.

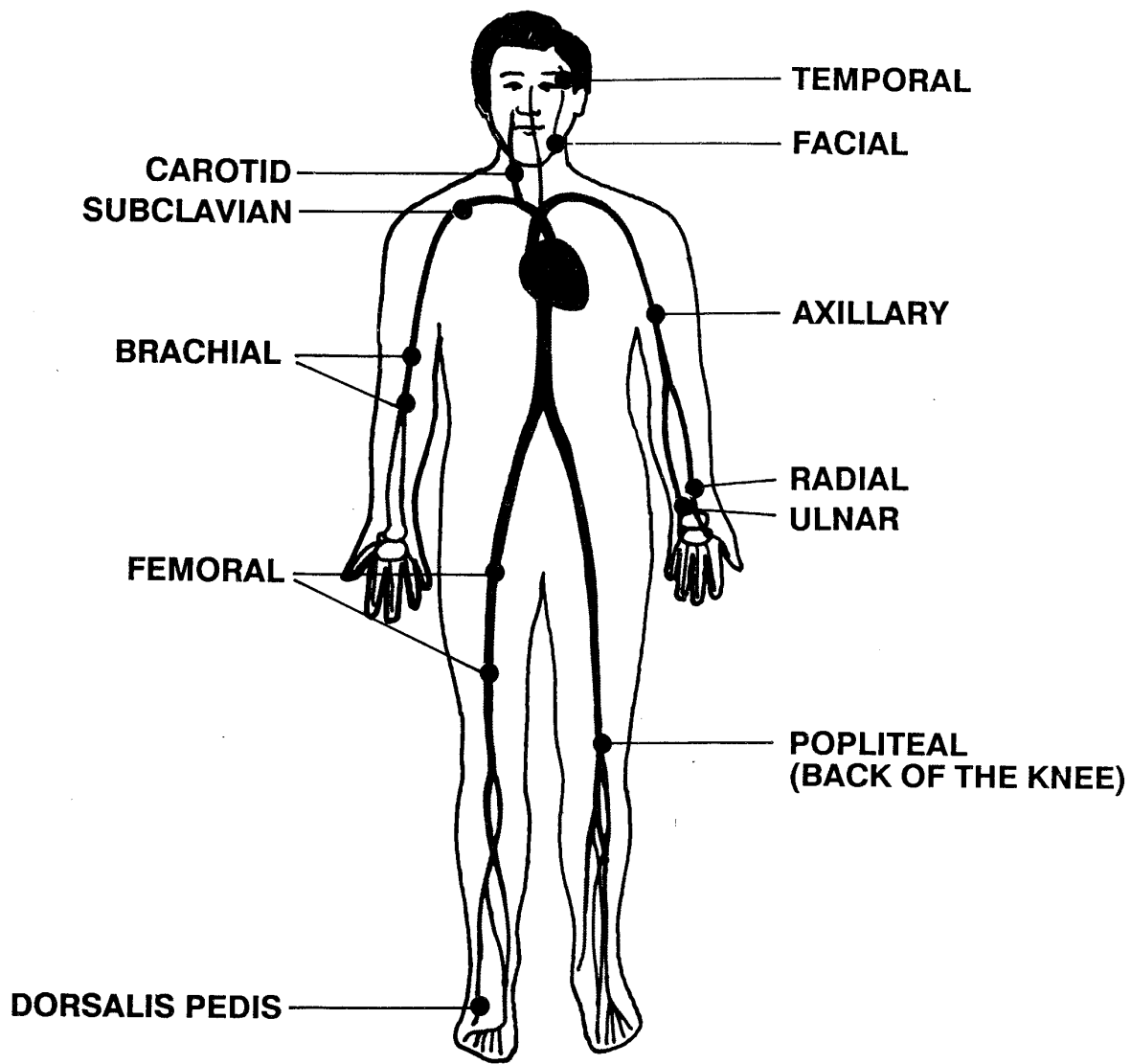
Arteries - Unless there is a small artery in the toe or finger direct pressure will not work. You should use digital pressure on a pressure point above the wound. Then tie a constricting bandage above the wound. Remember constricting bandages do not have to be used on pressure points. If this does not work then use a tourniquet as a last resort on a pressure point.

Remember location of pressure points. Twenty-two (22) in the body; eleven (11) on each side.

Definition of a pressure point: Where arteries pass close to the surface of the skin over a bony structure.

Steps in applying a tourniquet in order:

- (1) Use a strong wide piece of cloth.
- (2) Select a solid object, pad it well and wrap the arm or leg with it next to the arterial pressure point.
- (3) Tie a half-knot on the outside of the arm or leg.
- (4) Insert a strong stick over the half-knot and tie in place.
- (5) Twist stick to apply pressure until bleeding stops.
- (6) Tell doctor when and for how long tourniquet was applied.



Physical Shock:

Definition of physical shock: An upset of the nervous system.

Causes of physical shock:

Severe loss of blood, intense pain, severe or extensive injuries, burns anxiety, poisonous gases, sight of blood or injury to fellow workers.

Symptoms or how to recognize a person in shock:

- (1) Chalk like appearance.
- (2) Dull or anxious expression.
- (3) Shallow breathing.
- (4) Cold, moist skin.

Treatment of physical shock in order:

- (1) Lay the victim flat.
- (2) Elevate the feet six (6) inches higher than the head.
- (3) Clear mouth of foreign objects.
- (4) Loosen tight fitting clothing.
- (5) Keep patient warm and dry.

Wounds and Burns:

Definition of an open wound: Any break in the skin.

Types of open wounds:

- (1) Abrasions - Made by rubbing or scraping skin against object.
- (2) Incisions - Wounds made by sharp cutting edges; narrow but usually not deep.
- (3) Lacerations - Wounds made by contact with heavy blunt objects which tear skin and usually leaves rough edges around skin.
- (4) Rupture or hernia - The pushing out of an intestine through the wall of the abdomen.

Treatment of a rupture or hernia in order are:

- (1) Lay person flat on back with knees drawn up.
- (2) Center cravat bandage across thighs half way between hips and knees.
- (3) Pass the ends around and cross under bends of knees.
- (4) Carry ends around ankles and tie in front.
- (5) Place pillow or rolled up blanket under knees.
- (6) Place second bandage underneath pillow and bring ends up and tie over knee.
- (7) Place cold towel or wrapped ice bag over the injury.

DO NOT FORCE THE PROTRUSION BACK.

Review foreign objects in eyes, throat and ears.

Burns:

- (1) 1st degree - Reddening of the outer layers of skin.
- (2) 2nd degree - Reddened skin, blisters, damage to underlying tissues.
- (3) 3rd degree - Most serious – skin is destroyed, area is usually charred.

Treatment for burns in order:

- (1) Remove clothing from burned area, unless stuck to the skin.
- (2) Cover burn with cool moist dressing (4 to 6 layers).
- (3) Cover victim with a blanket.
- (4) Treat for physical shock.

Fractures and Dislocations:

Definition of:

Simple fracture - Bone may be cracked or broken but does not punch through skin.

Compound fracture - Bone is broken and one or both ends punch through skin.

Symptoms of fractures:

- (1) Localized pain.
- (2) Loss of function.
- (3) Deformity of affected limb.
- (4) Moderate or severe swelling.

Immobilize to keep patient from moving broken bone.

Fifteen (15) bandages to secure person to hardwood board for broken neck; thirteen (13) for broken back; eight (8) for broken pelvis.

Transportation:

Always transport patient in a lying down position.

Review use of stretcher.

Three (3) man lift and carry.

Location of first aid equipment:

- A. At the mine dispatcher's office and one on the surface in close proximity to the mine.
- B. At the bottom of each regularly traveled slope or shaft.
- C. On each working section not more than five hundred (500) feet from the working face.

CPR SUPPLEMENT

CPR (Cardio Pulmonary Resuscitation) is only given to a victim who has no heartbeat and who is not breathing.

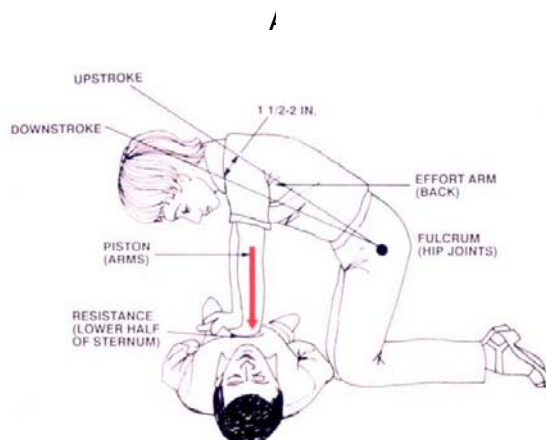
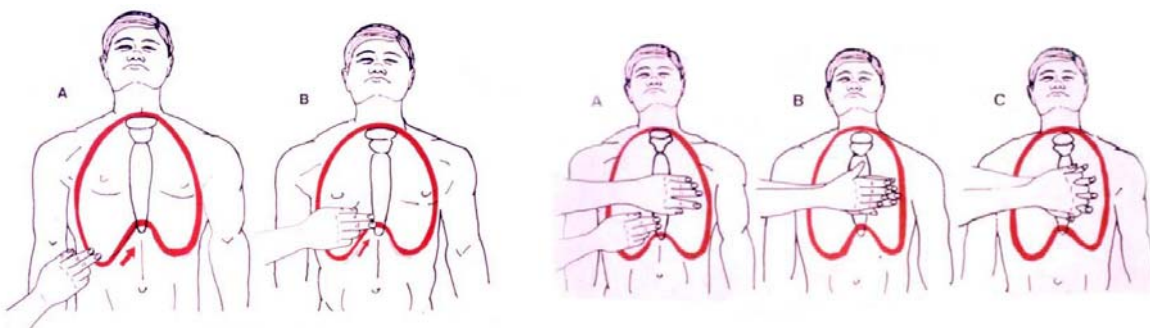
If the victim has a heartbeat but is not breathing you should only administer artificial ventilation.

The normal breathing rate is 12 to 15 times per minute and when you give artificial ventilation to a victim you want to give 12 breaths per minute (one every 5 seconds).

When giving CPR, the ventilation rate is also 12 breaths per minute (one every 5 seconds). But you also must give cardiac compressions between breaths at the rate of 5 compressions for every breath when two (2) people give CPR and 15 compressions for every 2 breaths when only one person administers CPR.

The compression depth should be 1-1/2 to 2 inches being administered in the center of the chest above the Xyphoid Process (the soft bone at the junction of the breast bones). The ball of the hand (being interlocked with the other hand) should be approximately 3 inches above the Xyphoid Process and the person administering CPR should try to keep themselves vertical to the compression push so that the force exerted is directly on the heart to create maximum flow.

Once CPR has begun, you should continue until (a) the person is revived, (b) you are relieved by someone who is trained in CPR, (c) you are physically exhausted and unable to continue, (d) pronounced dead by a physician.



C