



Underground 06 (Black Hat) Study Guide

- 1. When should you don your SCSR?**
At the first sight or sign of smoke, fire or 50 ppm CO
- 2. How often should you do a visual inspection of your SCSR?**
Everyday before going underground
- 3. What is the minimum quantity of air flow required in all working faces?**
3000 CFM
- 4. How should a man-trip be operated?**
Under full control at all time
- 5. What is the maximum speed a man-trip can be operated?**
12 MPH
- 6. How many red hat (apprentice miners) can a black hat (certified miner) be in charge of at any given time?**
One (1)
- 7. What is the purpose of a face line brattice or line curtain?**
It's a curtain hung from the last open crosscut to direct air into the face to eliminate dust and gas build up in the area
- 8. On a belt conveyor that is not used for transportation of coal miners, at what distance are stop and start controls required to be installed?**
At least every 1000 foot

- 9. What effect does the presence of small amounts of methane have on the explosibility of coal dust?**
It increases the explosibility
- 10. What is a check curtain?**
A temporary curtain erected to deflect air and can be traveled through by mobile equipment and miners
- 11. Who is responsible for ensuring that the equipment is in safe and proper working order and reporting when it is not?**
The equipment operator assigned to the equipment
- 12. What shall all belt conveyors be inspected for daily?**
Frozen rollers, roof falls, rib rolls, mine gases, fires, and anything that may be a danger according to the WV mine laws
- 13. When can guarding be removed from belt heads?**
When power has been removed from the belt head and it has been tagged and locked out from the power source
- 14. What record is required of miners entering or leaving the mine?**
The mines tracking system and the check-in check-out board
- 15. What is the duty of equipment operators and helpers, relative to others in the vicinity, while the equipment is in operation?**
- They shall not permit other persons to remain near the equipment
 - They shall keep themselves and others out of pinch point areas of the equipment
- 16. What protective devices should be used on gears, belts and revolving parts of machinery?**
Properly installed guards and shields
- 17. What precautions should be taken with machinery and equipment raised for repairs?**
It should be securely blocked to prevent accidental falling
- 18. What examination shall be made before taking a machine in by the last open crosscut of a working section?**
Methane gas examination in by the last open crosscut

- 19. How close to the face should a line curtain be hung?**
Not to exceed 10 feet
- 20. At what percentage of methane gas is equipment prohibited to operate in?**
1.0% or above
- 21. How often shall gas examinations be made in face areas where equipment is operating?**
At least every 20 minutes
- 22. Where is the primary escape route located?**
In the intake airway
- 23. What shall the incoming communication signal activate on the working section?**
An audible or visual alarm is activated on the mine phone
- 24. What is the purpose of a panic bar?**
To quickly de-energize a piece of equipment in the event of an emergency
- 25. When are hoses and gauges from oxygen and acetylene tanks required to be disconnected while underground?**
When not in use and when being transported
- 26. How many air courses must have two-way communication?**
Two (2) separate air courses, one (1) of which must be the intake airway
- 27. What is the best method for testing roof and ribs?**
By the sight, sound and vibration method
- 28. Who should perform pre-operational checks on equipment prior to putting into operation?**
The person operating the equipment
- 29. If methane reaches nine (9) percent, the greatest danger is:**
Explosion
- 30. What is the proper tool used to set timbers?**
Hammer

31. A miner could receive a personal fine or assessment for violating any WV Mine Law.

True

32. A self-contained self-rescuer (SCSR) provides protection against:

- Carbon monoxide
- Oxygen deficiency
- Carbon dioxide

33. Persons shall not cross a moving conveyor belt except:

Where suitable crossings facilities are provided

34. The following is required to be on a working section:

Two-way communication or telephone

35. Why should line curtain be kept close to the face?

- To keep methane removed from the face
- To keep coal dust removed from the face

36. Exposed wires in power cables shall be:

Repaired immediately by a certified electrician

37. What gas is odorless, colorless, tasteless and explosive in a concentration of five percent (5%) to fifteen percent (15%)?

Methane

38. What shall be the minimum percentage of incombustible material after rock dust has been applied to all entries?

80%

39. Mining equipment shall not be parked within how many feet of a check curtain or a fly curtain?

Fifteen (15) feet

40. Properly installed guards shall be used on what?

- gears
- belt drive and take up
- revolving parts of machinery

- 41. A visual examination of what shall be made immediately before any work is started?**
Roof, face and ribs
- 42. What should be done when there is a 1% reading of methane detected anywhere in a working mine?**
Shut off power to all equipment in the affected area and re-ventilate.
- 43. What would be a source of CO (carbon monoxide) in coal mines?**
Combustion (Fire)
- 44. What is the explosive range of methane?**
5% to 15%
- 45. What is the principle gas found in coal?**
Methane
- 46. What is required in escapeways from the last permanent stopping to the surface or nearest escape facility in WV coal mines?**
Lifeline cord
- 47. What is the minimum percentage of oxygen that is required to be present throughout the mine?**
Nineteen and one-half percent (19.5 %)
- 48. Where is methane generally found in a mine or in the face?**
Methane is lighter than air and it is released from coal, therefore, when it is released it migrates upward, into high places.
- 49. Where is Hydrogen gas generally found in a mine?**
In and around battery charging stations
- 50. Where is Carbon Monoxide (CO) found in relation to the height of the mine entry?**
Along the mid height area of the entry
- 51. How many gases does the typical Multi-Gas Detector detect?**
Three (3), (Methane, Oxygen and Carbon Monoxide)

- 52. How often does a Multi-Gas Detector have to be calibrated?**
Every thirty (30) days
- 53. What poisonous gas is exhaled when we breath?**
Carbon Dioxide (CO₂)
- 54. What type of alarms are activated when a gas is detected on the Multi Gas detector?**
Audible, Visual and Vibration
- 55. What is the multi-gas detector's low alarm level for methane?**
1% or below
- 56. What is the multi-gas detector's low alarm level for O₂?**
19.5 % or below
- 57. What is the multi-gas detector's low alarm level for CO?**
50 PPM or below
- 58. In fresh air, what should be the O₂ reading on the multi-gas detector?**
20.8% to 21.0%
- 59. If someone has a compound fracture, you should attempt to set the broken bone.**
False
- 60. If a victim has a broken forearm, where would you tie the splint when applying?**
Above and below the break to immobilize the limb
- 61. The first method of controlling bleeding is to?**
Apply direct pressure on the wound
- 62. If a choking victim becomes unconscious, you should?**
Use abdominal thrusts
- 63. A miner is exposed to severe cold for an extended period of time. What would you treat him for?**
Shock, hypothermia and frostbite
- 64. Victims of electrical shock can be?**
Extremely burned, disoriented and without a pulse

- 65. A victim who has fallen, should be treated the same as?**
If they had a broken spine or neck
- 66. If someone gets a foreign object stuck in their eye, you should treat by:**
Covering both eyes and immediately get to a doctor
- 67. All accident victims of a serious injury should be treated for shock.**
True
- 68. Cardiopulmonary Resuscitation (CPR) is administered to someone who has?**
Stopped breathing and has no heartbeat
- 69. How often shall each coal mine employee be required to take a refresher First Aid Course?**
Not less than five (5) hours every twenty-four (24) months of employment
- 70. What is the proper way to move an unconscious victim onto a back board?**
Perform a four (4) man log-roll maneuver, with each four (4) men in place, roll the victim carefully while keeping the spine straight, slide the board under the victim, lower him/her down onto the board in unison, pad and strap accordingly.
- 71. Which of the following can prevent accidents?**
- Paying close attention to your surroundings
 - Not taking chances or shortcuts
 - Follow safe operating procedures
- 72. Frost bite can cause the loss of fingers and toes.**
True
- 73. If an accident victim has severe burns from an electrical explosion, you should cover the burn area with an ointment before dressing.**
False
- 74. What is the most important thing to do if you suspect a spine or back injury?**
Immobilize head and neck before and after placing on stretcher

- 75. If a patient had a broken arm, a cut on his/her head and blood spurting from an open wound on the leg, which injury would you treat first?**
Blood spurting from open wound
- 76. When performing CPR, when should you quit doing chest compressions?**
Only when you are being relieved of the duty by another qualified person or when you just can't go any further because of fatigue and there is no one else available to assist or relieve you.
- 77. When performing artificial ventilation, how many breaths per minute should you give the victim?**
Twelve (12) (One breath every 5 seconds)
- 78. What is the universal sign for choking?**
The victim clutching his/her throat with their hands
- 79. What is the "First Priority" in an emergency situation within the mine?**
Exhaust every effort to evacuate the mine
- 80. After all means have been exhausted and escape is not possible,**
You should proceed to the nearest mine shelter facility and prepare the unit for entrance.
- 81. How long should your stored SCSR provide breathable air?**
Rated for 60 minutes
- 82. Once inside the shelter, you must monitor the atmosphere inside the Shelter.**
True
- 83. How many entries are designated as escapeways from the working section to the nearest available opening on the surface?**
Two (2)
- 84. Can the oxygen level be controlled within the shelter's atmosphere?**
Yes

85. How long can you survive in a shelter before your breathable air is depleted? (this is an approximate time with the shelter completely full).

96 hours

86. What should be the minimum oxygen level inside a shelter when occupied?

19.5%

87. What is a good way to preserve oxygen while awaiting rescue from within a shelter facility?

- Lay down and be quiet
- Don't exert yourself
- Stay calm and collected

88. When can you safely remove your SCSR after entering a shelter?

After everyone is inside, the unit has been purged and the atmosphere tested clear.

89. After entering the shelter, when should you exit back into the mine?

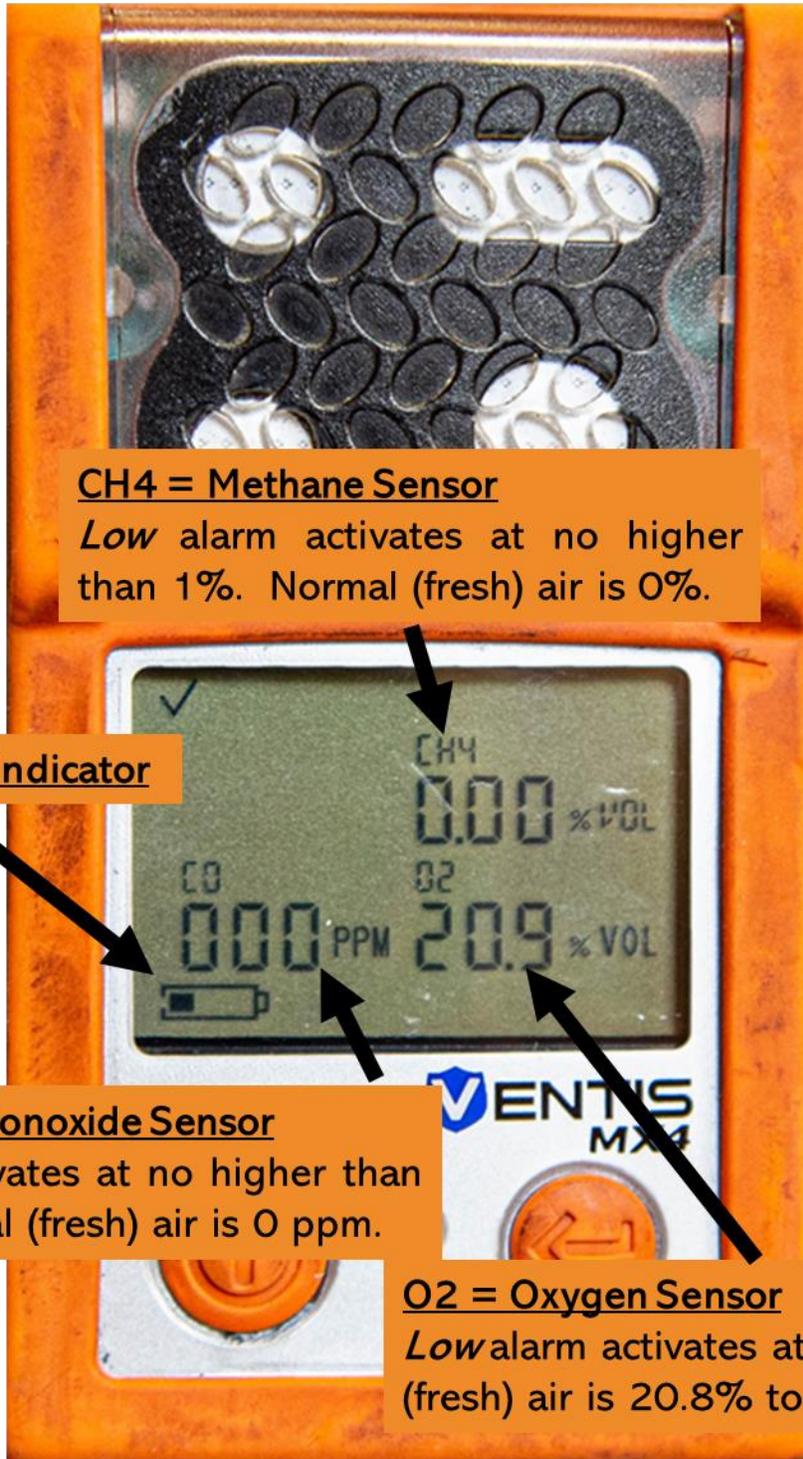
After the Rescue Team instructs you to exit, and only then should you leave the shelter.

90. Where must you keep your personal SCSR?

Worn on your person or within immediate arms reach

Basic Three (3) Gas Detector

Audible (beeps), Visual (lights)
and Vibration Alarms



CH4 = Methane Sensor

Low alarm activates at no higher than 1%. Normal (fresh) air is 0%.

Battery Charge Indicator

CO = Carbon Monoxide Sensor

Low alarm activates at no higher than 50 ppm. Normal (fresh) air is 0 ppm.

O2 = Oxygen Sensor

Low alarm activates at 19.5%, Normal (fresh) air is 20.8% to 21%.

GAS TESTING

THE FOLLOWING ARE DETECTOR ALARM LEVELS FOR METHANE (CH₄), CARBON MONOXIDE (CO), and OXYGEN (O₂).

1% OR LESS METHANE (CH₄) LOW ALARM LEVEL

1.5% OR LESS METHANE (CH₄) HIGH ALARM LEVEL

50 PPM OR LESS CARBON MONOXIDE (CO) LOW ALARM LEVEL

100 PPM OR LESS CARBON MONOXIDE (CO) HIGH ALARM LEVEL

19.5% OXYGEN (O₂) LOW ALARM LEVEL

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

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 AND THE AFFECTED AREA REVENTILATED TO LOWER METHANE LEVELS. A RETEST FOR METHANE WILL BE PERFORMED TO CONFIRM THE METHANE HAS BEEN REMOVED.

WHEN METHANE (CH₄) LEVELS REACH 1.5% POWER TO ALL EQUIPMENT IN THE AFFECTED AREA IS DEENERGIZED AND MINERS (MEN/WOMEN) REMOVED. THE AREA MUST BE REVENTILATED TO LOWER METHANE LEVELS AND RETESTED PRIOR TO MINERS REENTERING THE AFFECTED AREA.

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

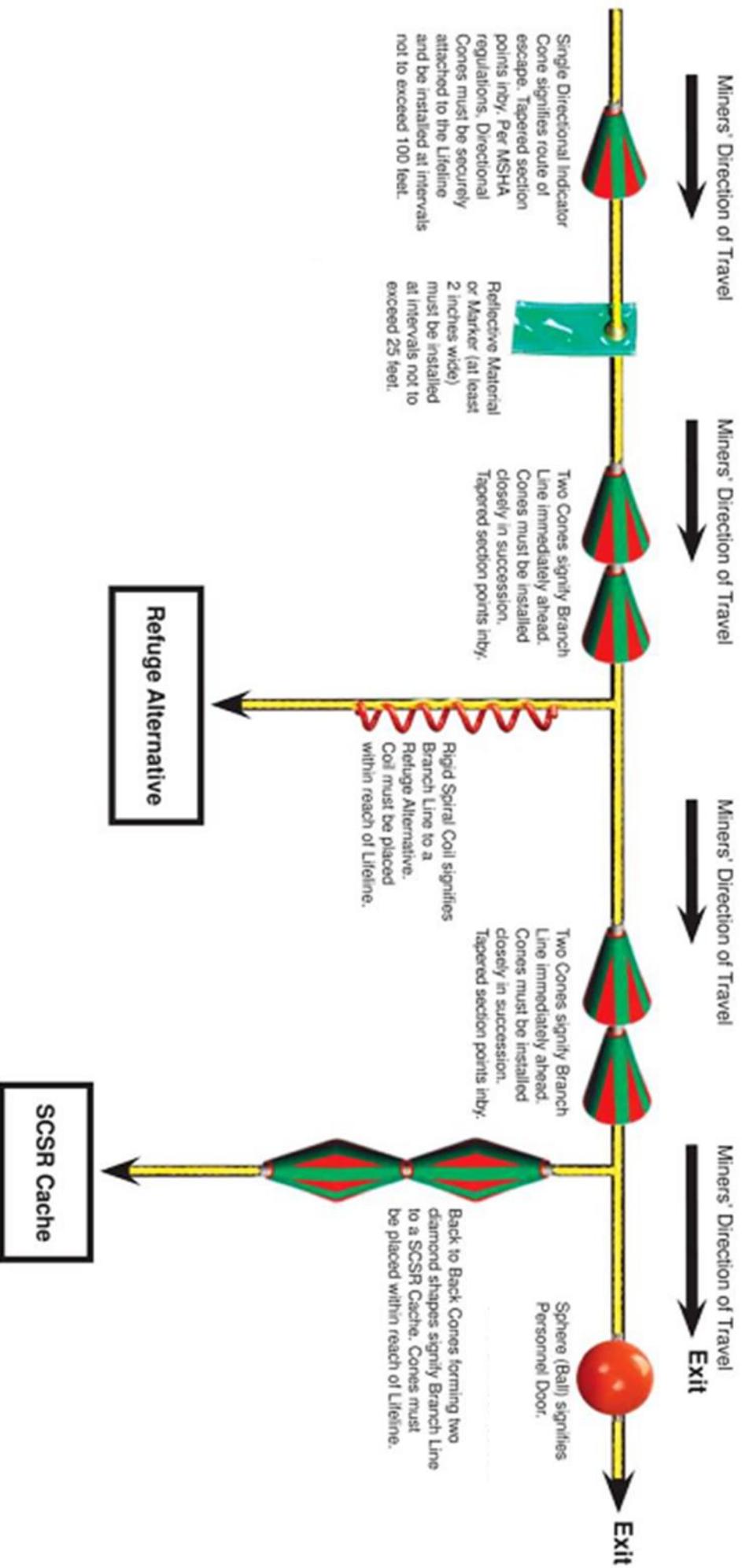
THE FOLLOWING ARE THE CHECKS PERFORMED ON A GAS DETECTOR PRIOR TO USE.

- 1. CHECK CASE INTEGRITY (SCREWS AND SEALS IN PLACE)**
- 2. CHECK SCREEN READABILITY (NOT SCRATCHED ENOUGH THAT YOU CAN'T READ)**
- 3. CHECK SENSOR SCREENS (MUST NOT BE BLOCKED OR PLUGGED UP)**
- 4. CHECK AUDIBLE AND VISUAL ALARMS**
- 5. CHECK BATTERY LEVEL (SHOULD BE FULLY CHARGED PRIOR TO USE)**
- 6. CHECK SENSOR ZERO (MUST ZERO IN FRESH AIR)**
- 7. CHECK CALIBRATION**

Carbon Monoxide Level	Signs and Symptoms Of Exposure	Oxygen Level	Signs and Symptoms Of Exposure
35 ppm	Headache and dizziness within 6-8 hours	23.5%	Maximum safe level. High levels of O2 present fire hazards
100 ppm	Headache and dizziness within 2-3 hours	20.8%	Normal air
200 ppm	Headache and dizziness within 1-2 hours, loss of judgement	19.5%	Minimum safe level. Most gas detectors will alarm at this level
400 ppm	Severe frontal headache within 1-2 hours	15-19%	First signs of hypoxia. Decreased ability to work. Respirations increase
800 ppm	Dizziness, nausea, convulsions within 45 min; insensible within 2 hours	12-14%	Breathing becomes difficult, rapid pulse, impaired coordination, poor perception and judgement. Possible loss of consciousness
1,600 ppm	Headache, rapid pulse, dizziness, nausea within 20 min. death within 2 hours	10-12%	Rapid respirations. Blue lips. Likely loss of consciousness. Eventual death
3,200 ppm	Headache, dizziness, nausea in 5-10 min. Death within 30 min.	8-10%	Mental failure, unconsciousness, ashen face, blue lips, nausea, vomiting, lack of mobility. Death
6,400 ppm	Headache, dizziness in 1-2 min. convulsions, respiratory arrest, death within 20 min	6-8%	Death within 8 minutes
12,800 ppm	Unconsciousness after 2-3 breaths. Death within 3 min.	4-6%	Coma within 40 seconds. Convulsions, death within minutes

Signs and Symptoms can always vary from person to person based on health and various physiological factors

LIFELINE REGULATIONS FOR UNDERGROUND COAL MINES



West Virginia mine law states that lifeline cords with reflective material at twenty-five foot intervals, from the last open crosscut to the surface will be provided.