MSHA Annual Refresher Training

Module 5

Airborne Hazards and Respiratory Devices

MSHA Training Requirement:

Instruction and demonstration on the use, care, and maintenance of self-rescue and respiratory devices. [Section 46.5(c)(1)]

Learning Objectives:

1. Understand the basic processes for monitoring respirable dust levels at mine worksites.
2. Identify and describe restricted chemical substances commonly encountered in mining operations.
3. Implement protective measures against airborne contaminants and physical agents to comply with exposure limits, including sampling, monitoring, record keeping, and conducting surveys.
4. Properly use, inspect, and maintain self-rescue and respiratory devices.
5. Follow recommended diesel fueling practices and maintenance standards for diesel engines.
6. Identify risks associated with exposure to diesel particulate matter (DPM) and employ effective control measures to mitigate this hazard.

Module Sections

- 5.1 Introduction to Airborne Hazards and Respiratory Devices
- 5.2 Respirable Dust
- 5.3 Chemicals and Physical Agents
- 5.4 Radiation Protection
- 5.5 Self-Rescue and Respiratory Devices
- 5.6 Diesel Contaminants and Protections

5.1 INTRODUCTION TO AIRBORNE HAZARDS AND RESPIRATORY DEVICES

This module will help you conduct work safely as you encounter airborne and chemical hazards at mine worksites. You will learn how to:

1. Understand the basic processes for monitoring respirable dust levels at mine worksites.
2. Identify and describe restricted chemical substances commonly encountered in mining operations.
3. Implement protective measures against airborne contaminants and physical agents to comply with exposure limits, including sampling, monitoring, record keeping, and conducting surveys.
4. Properly use, inspect, and maintain self-rescue and respiratory devices.
5. Follow recommended diesel fueling practices and maintenance standards for diesel engines.
6. Identify risks associated with exposure to diesel particulate matter (DPM) and employ effective control measures to mitigate this hazard.

Airborne Physical Agents and Chemical Hazards

Both physical and chemical agents require *specific* control strategies to ensure your health and safety, with physical agents focusing on dust control, and chemical agents emphasizing sampling, detection, and the management of these hazards.

Module Warmup

Why Preventing Airborne Hazards Matter?

Understanding how to identify and prevent airborne hazards at mine worksites is not only a procedural requirement but an invitation to take personal responsibility to learn and confidently follow safety regulations and procedures.

There are numerous potential consequences of neglecting airborne physical and chemical agent safety protocols and regulations at mine worksites. By understanding key airborne hazards, you will be better able to avoid accidents and keep both yourself and your coworkers safe.

The rest of this module will prepare you for both physical and chemical agents, paying particular attention to dust, chemicals, radiation, and diesel. Additionally, you will learn about the effective use of self-contained self-rescuers (SCSR) and respiratory devices and how they will help you manage airborne hazards at a mine site.

5.2: RESPIRABLE DUST

A Brief Overview of Key Dust Sampling Concepts

Understanding and effectively monitoring respirable dust levels is crucial for ensuring your health and safety, as prolonged exposure to such dust, particularly quartz, can lead to severe respiratory conditions like pneumoconiosis and silicosis. Utilizing approved sampling devices that compare with the Mining Research Establishment (MRE) in proper areas such as active workings cannot only protect your health but also help in maintaining operational efficiency by optimizing dust control measures and ensuring your worksite adheres to federal safety regulations. We will look at some of these concepts in further detail in the remainder of this module.

Measuring Equivalent Concentration

Equivalent concentration is measured in **milligrams per cubic meter of air (mg/m^3)**. To identify equivalent concentration, you would first use your sampling device to collect dust from the air over a certain amount of time, with your unit of time being in minutes. To calculate the volume of air, you would multiply your time sampled (in minutes) by the sampling airflow rate (in cubic meters per minute). Next, you would divide the weight of the dust you collected on the filter (in milligrams) by the volume of air that passed through the device during that time (in cubic meters). This will give you the concentration in milligrams per cubic meter (mg/m^3).

To make it easier to understand and compare across devices, you would then convert this concentration to an equivalent value set by the MRE instrument, depending upon the device you used.

Sampling Locations for Respirable Dust Levels

Respirable dust level samples are taken in a variety of locations, with one primary area being known as a **designated area (DA)**, which the mine operator selects in the mine ventilation plan. The DA is where they take samples to check how much dust is being produced in the **active workings,** or any place in a coal mine where miners are normally required to work or travel. The District Manager has to agree that the DA is a good spot, and then MSHA gives it a four-digit number to document the sample location.

At times, you may work with a **mechanized mining unit (MMU)**, which is heavy machinery or mining equipment for material production. They may include excavators, bulldozers, haul trucks, drill rigs, loaders, and more. Because MMUs introduce additional equipment into an area, they can increase dust levels for you and others working in that location. To help track the machinery location, each mechanized mining unit in the mine gets a four-digit ID number from MSHA. This number stays with the unit, even if it moves to another part of the mine.

Both DAs and MMUs have **production shifts,** or a shift in which material is produced; for DAs, it can also include routine or normal day-to-day activities that occur in that area.

If the MMU produces at least 80% of the average amount it usually produces based on the last 30 shifts (or all shifts if there are fewer than 30 recorded), then it is known as a **normal production shift.**

What does this have to do with dust samples?

When monitoring dust, you, your mine operator, or another authorized worker may have to get a **representative dust sample,** or typical dust concentration level in a given area. Remember that this has to be expressed as an equivalent concentration.

Once you know the results of respirable dust samples, you may find that some MMUs have a **designated occupation** (DO), which means that there is a specific job or task being performed on an MMU that has been identified as having the highest respirable dust concentration. This designation helps your operator and others to focus on areas where dust levels are highest, allowing for better control and monitoring of potential health risks for you and other miners.

Similarly, an **other designated occupation** (ODO) is when an additional task on an MMU besides the main one (DO) is designated for sampling per regulations. Each ODO gets its own unique four-digit number for identification by MSHA. This helps ensure that all areas with significant dust exposure are monitored properly to reduce your risk of exposure.

You have some of the foundational pieces for understanding some of the regulations guiding the control of dust at your worksite. Let's continue to explore some of the things that can affect your air quality at your worksite.

5.3 CHEMICALS AND PHYSICAL AGENTS

When you are at a mine worksite, it is important to consider the various factors that can affect the quality of the air around you. Dust, gases, and chemicals can be present, or exacerbated by primary or secondary work processes.

Regardless of the mining work process, working directly with chemicals such as explosives, diesel fuel, or rock dust additives can often release harmful vapors if not handled properly.

In this section, we will look at safety procedures regarding the restricted use of chemicals and specific protective measures that you can take against chemicals and contaminants.

Restricted Use of Chemicals

You might use chemicals *for* your mining work or you might find that your work can *produce* chemicals and harmful gases.

Whether you are working in a surface or underground mine, there is a list of chemical substances that are not allowed to be used or stored *unless* you are trained and skilled to do so. Even if you are trained and approved to work with these chemicals, you are required to work with them under specific laboratory conditions that have been approved by a nationally recognized agency acceptable to the Secretary of Labor.

Federal regulations require that you are trained in a dedicated lab with protective equipment before using these chemicals. You will not be permitted to use these chemicals without further guidance.

Protective Measures Against Chemicals and Physical Agents

Now that you are aware of some chemicals and contaminants that you will work with or be exposed to while mining, let's look at the different protective measures you can take when working around chemicals and contaminants at your mine worksite.

To protect yourself and others from the negative effects of these chemicals and other contaminants, be sure you are aware of the following protective measures required by MSHA, *regardless* of whether you are working in above- or below-ground mines, and whether these mines are metal or nonmetal.

First, you or your mine operator may conduct surveys, or checks, for dust, gas, mist, fibers, and fumes. These must be done often enough to ensure that control measures are working effectively.

Second, you will need to be sure you are monitoring your oxygen levels when working underground. Your air in all active underground workings must contain at least 19.5% oxygen by volume. This is a safety threshold established to prevent you and others from experiencing

hypoxia (a deficiency in the amount of oxygen reaching the tissues) or other health issues related to insufficient oxygen.

Finally, your and others' exposure to airborne contaminants should not exceed acceptable levels set by the American Conference of Governmental Industrial Hygienists (ACGIH). This document can be obtained from ACGIH or viewed at any Metal and Nonmetal Mine Safety and Health District Office. Short-term exposure above these limits should not exceed the permissible levels described by the ACGIH.

One exception to this is **asbestos** because of its known health risks – it can cause serious lung issues, even at low levels of exposure. We will discuss asbestos in the next section.

How do you prevent and control your exposure to airborne contaminants?
MSHA regulations advise that your exposure to harmful airborne contaminants should be controlled as much as possible by:

- Preventing them from getting into the air to begin with
- Removing them with special exhaust fans
- Diluting them with clean, uncontaminated air

However, where acceptable control measures have not been developed or if the work requires it–such as occasional entry into contaminated areas–you may work in higher levels of contaminants for a short time as long as you wear protective respiratory equipment. You will learn about protective respiratory equipment later in this module.

Asbestos

In addition to chemicals, there are other contaminants at the mine worksite that can affect your health and safety. One such airborne hazard that has been studied extensively is **asbestos**.

Asbestos is a type of mineral that breaks down into tiny, flexible fibers when it is crushed or worked with. It includes different types such as chrysotile, amosite, crocidolite, anthophylite, tremolite, and actinolite. An asbestos fiber is any of these tiny fibers that is longer than 5 micrometers (a tiny unit of measurement) and has a specific shape, which is that the length to diameter ratio is at least 3 to 1.

5.1: A close-up image of a chrysotile asbestos fiber.

Due to its harmful health effects, asbestos has been heavily regulated and phased out in many industries. However, you might be exposed to asbestos when you work around products that contain it, like certain types of insulation, pipes, or other construction materials. If these materials get processed or disturbed, tiny asbestos fibers can float in the air; you might breathe them in without even realizing it!

Checking for Asbestos

The first step to reducing your exposure and increasing your safety around harmful contaminants, such as asbestos, is to understand how to check for the presence of asbestos. To do this, you will use a technique called **phase contrast microscopy (PCM)** or equivalent that can accurately measure potential asbestos exposure exceeding the 0.1 f/cc full-shift limit or the 1 f/cc excursion limit (more on these limits in a moment). Then, using this technique, you will follow the OSHA Reference Method found in OSHA's 29 CFR 1910.001 Appendix A.

If PCM shows that asbestos levels might be too high, you should use a more detailed method called **transmission electron microscopy (TEM)** using the NIOSH Method 7402. If the amount of asbestos in the air goes above safety limits described below, employees must leave that area.

Permissible Exposure Limits (PELs)

The second step to reducing your exposure to asbestos is understanding what limits are safe for you to work within. MSHA has already identified these limits for you.

During a full work shift, you should not breathe in more than 0.1 fiber of asbestos per cubic centimeter of air (f/cc). This keeps your average exposure low over a whole workday. Additionally, at any given time, you should not be around asbestos levels higher than 1 fiber per

cubic centimeter of air, measured over a 30-minute period. This prevents any short periods of high exposure.

Now, you understand important safety regulations for reducing your exposure to harmful chemicals, contaminants, and other airborne hazards at your mine worksite. Next, we will look at another possible hazard you can encounter: radiation.

5.4 RADIATION PROTECTION

You may work with products that contain or produce radioactive material at a mine worksite. For instance, uranium, certain kinds of coal, and phosphate can all contain levels of radioactive material or undergo radioactive decay. It is vital to protect yourself against exposure to radioactive material. In this section, we will review MSHA's regulations on monitoring, exposure, and protection against radon, radon daughters, and radiation.

Radon and Radon Daughters

Radon is an odorless, invisible radioactive gas that is found when uranium undergoes radioactive decay, which is an unpredictable process that begins with unstable particles within the material. When going into radioactive decay, radon becomes known as **radon daughters**, which can later emit radiation and lead to various health hazards, including cancer.

Radon Protections

There are several protections you can take to help mitigate harmful radon exposure. When working at your mine site, you or someone else at the operation must:

- Perform sampling of exhaust mine air to check for radon daughter concentrations.
- Record radon sampling data and maintain records at the mine site.
- Monitor your exposure to radon daughters and comply with recommended limits.
- Understand exposure record-keeping requirements and how to request access to your exposure records.
- Use appropriate respiratory protective equipment in areas with high concentrations of radon daughters.
- Identify and comply with warning signs in areas with high radon levels.
- Conduct annual gamma radiation surveys in underground mines and monitor exposure levels.

You now understand the importance of testing, monitoring, recording, and protecting against radiation. Next, we will look at how self-rescue and respiratory devices can protect you against airborne hazards.

5.5 SELF-RESCUE AND RESPIRATORY DEVICES

The use of respirators and self-rescue devices may be required, or necessary, due to the various hazardous conditions encountered in facilities, surface, or underground mines.

At facilities mines, such as processing plants or material handling areas, you may be exposed to airborne particles, gases, or chemicals released during the mining and processing of minerals.

Surface mining operations where activities like drilling, blasting, and earthmoving are often utilized, can release dust, silica, and other airborne contaminants into the atmosphere. If you are operating heavy machinery or performing tasks in close proximity to these activities you are at risk of inhaling harmful substances, making respirators vital for protecting your respiratory health.

In underground mines, where confined spaces and poor ventilation are common, the risk of exposure to hazardous gases like methane and carbon monoxide is heightened. Additionally, the potential for roof collapses or other emergencies necessitates the availability of self-rescue devices to help you escape safely in the event of an emergency.

Accordingly, you must know how to safely operate and maintain self-rescue and respiratory devices to mitigate risks from airborne hazards at mine worksites.

Use of a Self-Rescuer Device

As a miner, a Self-Contained Self-Rescuer device (SCSR) may be the difference between rescue, a proper recovery, or a fatality. While an SCSR can save your life, you must know how to inspect the unit correctly so that you can be sure that it will work properly when you need it.

What is a SCSR?
A SCSR is a portable tool that typically consists of a compact, lightweight canister containing a chemical oxygen generator, breathing bag, mouthpiece, and nose clip. These components work in tandem to provide a temporary, but crucial, source of breathable air if you are in a compromised air environment.

How does a SCSR work?
The chemical oxygen generator within the SCSR undergoes a chemical reaction when activated, producing oxygen that is then delivered to the user through the breathing bag and mouthpiece. This self-contained system ensures that you have access to a clean air supply even in situations where the surrounding atmosphere is contaminated with toxic gases such as methane, carbon monoxide, or hydrogen sulfide.

The compact size of a SCSR allows for convenient deployment during emergencies without impeding your mobility or ability to perform safe emergency procedures until you are out of harm’s way.

When might I need to use a SCSR?

A SCSR can provide respiratory protection during emergencies such as fires, gas outbursts, explosions, or escape and evacuation.

Proper SCSR Care and Maintenance

Federal law requires that mine operators follow a proper maintenance schedule. In addition to SCSR guidance at an individual mine worksite, remember to always comply with the *manufacturer's recommendations* for inspection, storage, care, maintenance, and the proper way to put on your SCSR!

Evacuating With a SCSR

If you must evacuate with a SCSR it is important to understand how the equipment may function and the personal experience that you might encounter.A proper SCSR will isolate your lungs from toxic gases and provide breathable oxygen during evacuation.

Removing the mouthpiece to talk or for any other reason may be fatal. *Keep your SCSR on!*

Does breathing with a SCSR feel the same as normal breathing?
Breathing with a SCSR differs from normal breathing; the temperature of the inhaled air will be slightly higher and there will be some breathing resistance. This is not harmful and does not warrant removal of the device. By proceeding as calmly as possible and controlling your physical activity level, such as walking pace, you will breathe more comfortably and maximize the duration of your SCSR.

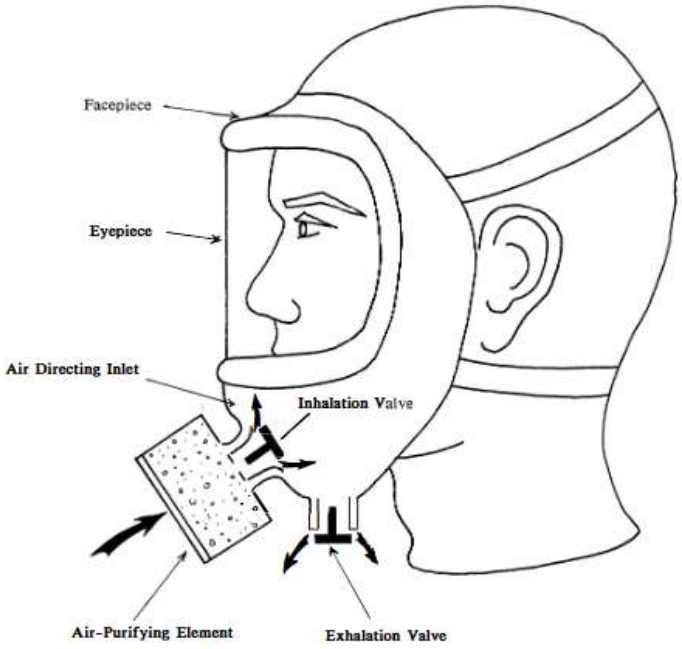
What if I become scared or nervous while wearing my SCSR during an emergency?
It is normal to experience an emotional reaction during an emergency escape. You are experiencing stress and likely what is sometimes referred to as the fight or flight response. This is the survival instinct that we are all born with; it prepares us to fight or run. This response prepares the body to *help* you in your escape.

Psychologists call an incident like an emergency escape from a mine a "traumatic incident". Responses to a traumatic incident include physical, mental, emotional, and behavioral changes. Remember that strong reactions and emotions are normal.

Use of a Respirator

The airborne hazards that you might encounter at a mine worksite may also require the use of a respirator. Respirators are designed to purify the air that you breathe or protect you from breathing *specific* airborne contaminants.

You must wear an assigned respirator whenever you are in designated work areas where there may be excessive exposure to dust or other hazards.



5.2: Typical Full-Facepiece respirator.

These areas must be clearly marked at a mine worksite as '**Respirator Required.**'

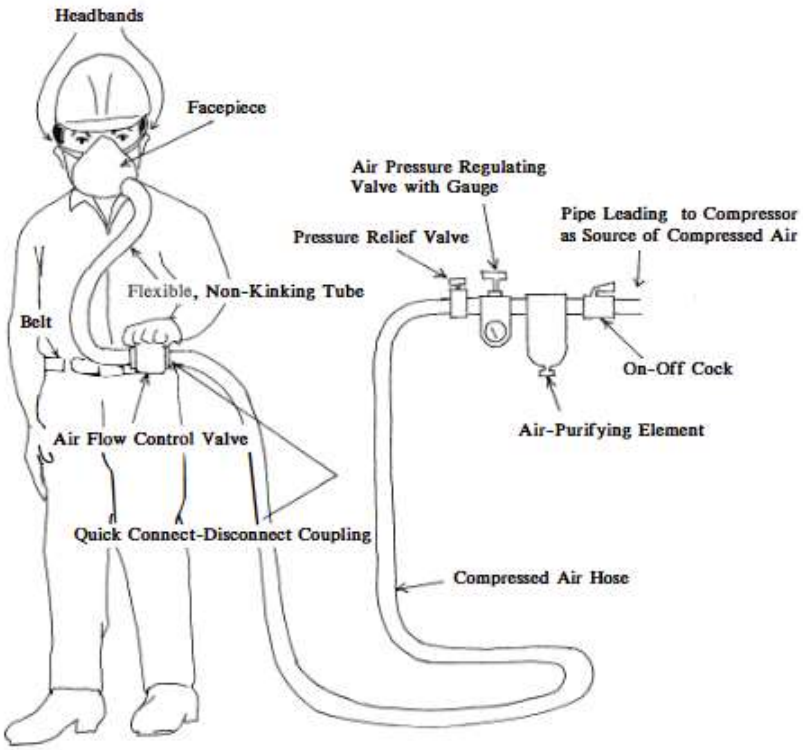
Additionally, supervisors will periodically inspect all 'Respirator Required' work areas to ensure that respirators are being used correctly.

This inspection should be part of management's daily walk-around routine!

Types of Respirators

Each mine worksite may use different types of respirator devices for different mining tasks. Management must inform you of the specific types of respirators used on site. Below is a list of common respiratory equipment that you might use at a particular worksite.

- Air-purifying respirator
- Atmosphere-supplying respirator
    - Supplied-air respirator (SAR) or airline respirator
    - Self-contained breathing apparatus (SCBA)
    - Demand respirator
- Negative pressure respirator (tight fitting)
- Positive pressure respirator
- Powered air-purifying respirator (PAPR)
- Pressure demand respirator



5.3: Continuous-flow respirator system.

Remember, management must inform you of the type, manufacturer model, and location of respirators used at a particular mine worksite!

Respirator Components and Functions

Different types of respirators may have different components and functions. Depending on which type of respirator you use at a mine worksite, you should check that its components are in proper working condition so it can effectively function. Common respirator components include a canister or cartridge, filter or air purifying element, filtering facepiece ("dust mask"), helmet, high efficiency particulate air (HEPA) filter, hood, loose-fitting facepiece, respiratory inlet covering, and a tight-fitting facepiece.

Additionally, there are specific processes to help ensure your respirator functions effectively.

Here are some different procedures and indicators that you might be asked to perform or evaluate before using a respirator:

- **Fit factor:** An estimate of how well a respirator fits a specific individual, typically indicating the ratio of ambient air concentration to concentration inside the respirator during use.
- **Fit test:** A procedure to assess respirator fit on an individual, conducted either qualitatively or quantitatively.

- **Assigned protection factor (APF):** The level of respiratory protection expected from a respirator or class of respirators in the workplace when a continuous and effective respiratory protection program is implemented by the employer.
- **End-of-service-life indicator (ESLI):** A system that alerts the respirator user when adequate respiratory protection is nearing its end, such as when the sorbent is approaching saturation.

Respirator Care and Maintenance

Just like any other equipment, respirators are only effective if they are in clean, good working condition. You should follow these steps to care for and maintain respiratory devices at a mine worksite:

- Inspect respirators prior to each use to determine that they are functioning properly.
- Clean and disinfect or replace the respirator on a regular basis according to manufacturer's recommendations, *or after each use*, if they are used by more than one person.

Management must provide adequate cleaning and disinfecting facilities, as well as clean and sanitary storage locations, for respirator care and maintenance!

You must also follow the respirator manufacturer recommendations for the use, care and maintenance of each model of any reusable respirator provided by the company. Management must also provide you with instructions on where and how to obtain new disposable respirators or respirator cartridges if yours:

- Becomes unusable
- Is unsanitary
- Exhibits excessive breathing resistance or breakthrough

Proper Wear of a Respirator

To determine if you are wearing a respirator correctly your management team or worksite safety officer will certify that you have been trained and fitted in the use, limitations, and maintenance of respiratory devices available at the worksite.

They will conduct **respirator fit testing** in accordance with the respirator manufacturer and model number. During the respirator fit testing, you will be tested for adequate protection against:

- Bitrex solution aerosol
- Saccharin solution aerosol
- Stannic chloride smoke

During the test, you must perform the following exercises for at least 60 seconds each:

- Normal breathing
- Breathing deeply

- Turning your head from side to side (inhaling in each position)
- Nodding your head up and down (inhaling in the up position)
- Counting or reading the rainbow passage

[Content on pp. 37-51 adapted from the Office of the Law Revision Counsel United States Code, “Public Law 109–236”, MSHA, “Self-Contained Self-Rescuer Training Instructor’s Guide” and OSHA, “Respiratory protection”]

5.6 DIESEL CONTAMINANTS AND PROTECTIONS

Diesel fuel is an important resource at your mine worksite. In addition to powering heavy machinery, such as loaders, haul trucks, excavators, and drills, diesel generators are used for lighting, electrical equipment, and as backup power sources in case of an emergency.

Recommended Diesel Fueling Practices

While useful, diesel fuel creates exhaust that contains harmful contaminants, including sulfur compounds, which can be dangerous to your health. Reducing sulfur content helps lower these risks, making your environment safer to breathe in. Additionally, low sulfur fuel and EPA-approved additives reduce harmful emissions, contributing to cleaner air and less environmental pollution. Finally, when you use low sulfur fuel and approved additives, you can help maintain the efficiency and longevity of your equipment, reducing breakdowns and maintenance costs.

Maintenance Standards for Diesel-Powered Equipment

You may have to bring equipment down into your underground mine to complete your work. If you use any diesel equipment underground, then you must be sure it is maintained properly.

Next, if you see that your equipment needs maintenance, then be sure to follow the **tagging and inspection requirements** below.

- Your mine operator must allow you to put a visible, dated tag on the equipment if you see signs that it needs maintenance in order to follow the above standards. Signs include unusual smoke, odor, or other visible defects that affect emissions.
- Your tagged equipment must be checked by a *qualified* or *authorized* mechanic before the end of the next shift during which a qualified mechanic is scheduled to work. The tag must stay on until the check is complete.
- Your mine operator must keep a log of tagged equipment, including the date tagged, date checked, mechanic's name, and actions taken. This log must be kept for one year after the check.
- Workers, mechanics, or others authorized to maintain diesel equipment must be qualified by training or experience. Your mine operator must maintain records proving this competence for one year after maintenance to be shown to authorities upon request.

Standards for Diesel Engines

If you bring any diesel engine into an underground mine, except for engines in ambulances or firefighting equipment used in mine emergency plans, you must ensure that it meets the following requirements.

The equipment must:

- Have a plate showing the engine is approved according to federal regulations (these include testing several technical aspects of the engine, exhaust, and emissions, among others).
- Ensure that the engine meets or exceeds the Environmental Protection Agency's standards for particulate matter emissions. You can access a listing of these standards in the Module Resource Materials section.

Exposure to Diesel Particulate Matter

As we have mentioned, the exhaust from diesel engines contains a mixture of gases and very small particles that can create a health hazard when not properly controlled. In addition to sulfur, you could be exposed to **diesel particulate matter (DPM)** when working around diesel. DPM comes from diesel exhaust (DE) and includes carbon, ash, metallic abrasion particles, sulfates and silicates that can be harmful to your health. Even if you are exposed to high concentrations of DE/DPM for only a short while, you may experience headache, dizziness, and irritation of the eye, nose and throat. Your risk of cardiovascular, cardiopulmonary and respiratory disease and lung cancer may increase if your exposure to DE/DPM is longer.

Annual DPM Training

If you expect to come in contact with diesel emissions at your mine site, your mine operator is required to provide annual DPM training to you and all other miners. Your operator must also retain a record at the mine site of this training for one year after training completion.

Federal Limits and DPM Compliance

There are regulations to help ensure that you are staying within acceptable, and under dangerous levels. These requirements are known as permissible exposure limits (PELs). MSHA has set, reviewed, and adjusted these limits for DPM several times since 2006. Currently, as determined by MSHA in 2008, your exposure to DPM must not exceed 160 micrograms of total carbon per cubic meter of air (160 $_{TC}$ $\mu g/m^3$) over an eight-hour shift. This limit could change, and if it does, MSHA will announce it in the Federal Register, which is a daily publication of the U.S. federal government announcing new and proposed regulations, notice of hearings, and other documents.

DPM Exposure Monitoring

Your mine operator is responsible for checking the air regularly to make sure you are not breathing in too much DPM, as outlined in MSHA regulations above.

Additionally, you and your authorized mine representative are allowed to observe when air quality is checked. Your mine operator must let you know ahead of time when this will happen!

What happens if air quality checks indicate a problem?

If the air quality checks show that someone is breathing in too much DPM (as defined as exceeding 160 $_{TC}$ µg/m^3 over an eight-hour shift), your mine operator must quickly inform you about the problem by posting on the mine bulletin board, start taking action to fix it by the next work shift, and finish addressing the cause promptly.

The results of air quality checks for DPM, including any samples taken by the Secretary, must be posted on the mine bulletin board within 15 days of receiving them and stay there for 30 days. Your mine operator must also give a copy of the results to your authorized miner representative.

Your mine operator must keep records of air quality checks for five years from the date of sampling, including details of how they were done.

Diesel Particulate Records

If a record needs to be kept at your mine worksite, your mine operator can store it elsewhere, as long as they can quickly access it electronically from the mine site.

If the Secretary of Labor, the Secretary of Health and Human Services, or a representative of miners asks, your mine operator must promptly grant access to any record.

Your mine operator must allow you, as well as former miners or their representatives with written consent, to view any record required by 57.5071 or 57.5060(d) if it pertains to you. Remember that 57.5071 is about exposure monitoring, or your right to observe sampling, your right to be notified of exposure, and your right to see the results of monitoring, including corrective action. The second regulation, 57.5060(d), refers to the *mine operator's requirement* to take measures to reduce your exposure to DPM.

The first copy must be provided to you at no cost, with any additional copies available to you for a reasonable fee.

If your mine operator stops operating, they must transfer all required records to any successor operator, who must maintain them for the required period!

Accountability and Compliance to Meet DPM Levels

Let's imagine that you are working at a mine worksite, and your operation finds that your exposure is exceeding these levels. However, they are not able to address this just yet. *Then what?*

If your mine operator needs more time to meet the final DPM limit because of technical or financial issues, they can apply for a special extension from the District Manager.

Your mine operator must certify that they posted a copy of the application at the mine worksite for at least 30 days before applying and give a copy to your authorized miners representative.

If approved, the extension cannot last more than one year from the date of approval. Your

operator can apply for more extensions, but each one cannot be longer than a year.

Your mine operator must follow the terms of the approved extension, post the approved extension at the mine for the entire period, and give a copy to your authorized miner representative.

Compliance Determination Procedures

To ensure your mine worksite is staying compliant with DPM exposure limits, MSHA will determine if the DPM limit is not being met based on a single sample collected and analyzed by the Secretary according to the below requirements.

The Secretary of Labor will collect DPM samples using a special dust sampler and analyze them for elemental carbon using the NIOSH method 5040. The Secretary may also use other NIOSH-approved methods that provide equal or better accuracy and will use samples taken over a full work shift to check for compliance.

Controls that Your Mine Worksite Should Take

Additionally, your mine operator must use feasible methods to reduce your exposure to DPM to the safe limit. If these methods do not work well enough, are not possible, or do not lower DPM levels much, your operator must still try to reduce exposure as much as they can. Your mine cannot just rotate miners to meet the DPM standard—they need to find other ways to comply!

They should also provide you with respiratory protection if needed. Your respirators must have:

- Filters approved by NIOSH for being highly effective at trapping particles (HEPA filters).
- Filters approved by NIOSH as being 99.97% efficient.
- Filters approved by NIOSH specifically for DPM.

Respirators without power that use suction to filter air must use filters labeled R or P, or any filter approved by NIOSH for DPM. An R-series filter should only be used for one work shift.

If respirators become necessary for you to complete your work, your mine operator must arrange for a private medical check-up by a physician or licensed healthcare professional (PLHCP) at no cost to you, to see if you can use a respirator before you are required to wear one at your mine worksite. You now understand federal regulations on diesel fuel and engines, as well as the importance of testing, monitoring, recording, and protecting against DPM.