

## **MAJOR PROGRAM POINTS**

# **"RESPIRATORY PROTECTION AND SAFETY"**

**Training for the  
OSHA RESPIRATORY PROTECTION STANDARD**

**Quality Safety and Health Products, for Today...and Tomorrow**

# **OUTLINE OF MAJOR PROGRAM POINTS**

The following outline summarizes the major points of information presented in the program. The outline can be used to review the program before conducting a classroom session, as well as in preparing to lead a class discussion about the program.

- **In today's world, we come in contact with more airborne contaminants than ever before.**
  - In the U.S. alone, more than 5 million workers wear respirators on the job.
  - Still, over 66,000 U.S. workers suffer severe exposure to airborne contaminants each year.
  
- **Contact with these contaminants can lead to:**
  - Blindness.
  - Lung damage.
  - Cancer.
  - Asbestosis.
  - Other serious illnesses.
  
- **Because of the severity of these problems, the Occupational Safety and Health Administration (OSHA) has created a regulation to protect workers from respiratory hazards.**
  - The regulation can be found in 29 CFR 1910.134.
  
- **One of the things that the regulation stresses is learning about respiratory hazards. They fall into three major groupings:**
  - Dust, mist and fumes.
  - Gases and vapors.
  - Oxygen deficiency and temperature extremes.
  
- **Dust, mist and fumes are tiny particles that were once parts of a larger mass.**
  - Later they were separated from their "parent" substances and became airborne.

- **Dust is produced when solid materials are broken down into fine particles during activities such as:**
  - Woodworking.
  - Crushing.
  - Grinding.
  
- **Mist is made up of droplets that are suspended in the air.**
  - These are created when pressurized liquids are sprayed.
  
- **Fumes are composed of solid particles given off when metals or plastics are heated, as in:**
  - Welding.
  - Furnace operations.
  
- **Unlike dust, mist and fumes, gases and vapors do not result from materials being fragmented. Instead, they are created by changes that take place on the molecular level.**
  - For example, gases occur when a substance is heated beyond a certain point.
  - As a result, the space between its molecules increases... and its density sharply decreases.
  - At the same time, it expands, becoming diffused through the air.
  
- **The molecules forming the gas are not separate from the material... the gas is the same substance, but in a different state.**
  
- **Materials can sometimes also exist in more than one state at the same time.**
  - For instance, a liquid can be heated to the point where only part of it is gaseous.
  - When this happens, the gaseous part is often referred to as a vapor.
  
- **Both gases and vapors can cause immediate irritation when they are inhaled.**
  
- **The final group of respiratory hazards includes:**
  - Oxygen deficiency.
  - Temperature extremes.

- **Oxygen deficiency occurs most often in confined spaces, and is caused by:**
  - Chemical reactions.
  - Fire.
  - Gases that push breathable oxygen out of the area.
  
- **A lack of oxygen can cause unconsciousness or even death in a matter of minutes.**
  
- **Temperature extremes can also be very dangerous.**
  - Hot air can burn your airway and prevent oxygen from being absorbed by your lungs.
  - Severe cold can freeze your lungs and respiratory tract and make it impossible to breathe.
  
- **To protect you from these hazards your body uses its natural defenses.**
  - During normal breathing, fresh air is drawn in through the nose, where coarse hairs trap large particles that have become airborne.
  - Next, the air comes in contact with a blanket of mucus and cilia (tiny hairs which line the respiratory tract.)
  
- **The mucus and cilia push the smaller particles to the back of the throat. There they are either:**
  - Swallowed.
  - Expelled by coughing.
  
- **Your respiratory system is an effective defense against normal hazards like house dust and pollen.**
  - But more dangerous substances, like poisonous gases and vapors, can sneak past our defensive system.
  - They can potentially damage your internal organs... even your brain.
  
- **When you work around respiratory hazards you need to be "combat ready". This means:**
  - Being aware of potential problems.
  - Reading the Material Safety Data Sheets (MSDSs) and container labels.
  - Following all safety procedures.

- **To begin this process, your safety department will run tests on your work environment to determine whether respiratory hazards exist. If necessary, they will:**
  - Install air processing systems that filter the air.
  - Set up emergency respirator stations.
  
- **Other engineering controls, such as lab hoods, can also help to keep the air you breathe clean.**
  
- **Environmental controls can reduce airborne contaminants too.**
  - For instance, spraying water on dusty surfaces will limit the amount of particulates that float into the air.
  
- **But even with systems like these in place, you still may encounter situations where more protection is needed.**
  - These conditions require you to wear a respirator.
  - However, if you suffer from a heart condition or asthma, you should not work in areas where respirators are required unless you have the proper medical clearance.
  
- **The respirator you use must be right for the job that you do. Depending on your type of work, you will use a respirator that:**
  - Filters the air you breathe.
  - Purifies the air through chemical means.
  - Provides its own source of breathable air.
  
- **OSHA's "Assigned Protection Factors" (APFs) will help your employer determine what respirator should be used in your work environment.**
  - APFs indicate how much protection various types of respirators provide.
  - In most situations, an air-filtering respirator is what will be called for.

- **Because oil-aerosols can sneak through certain types of filtering systems, NIOSH has created three filter classifications, based on the amount of oil-aerosols present on the work site.**
  - If there are oil-aerosols present, you must use a filter that is coded P (for oil-proof) or R (for oil-resistant).
  - If no oil-aerosols are present, you can use an N coded Filter (not-oil-proof).
  
- **When using any filter, make sure to follow all of the manufacturer's recommendations.**
  - Pay special attention to the suggested "time use limits."
  
- **Once your employer has determined whether you should use an N, R or P series filter, you will need to make sure that the filter you select is also strong enough to block the airborne hazards you are working around.**
  - The strength of a filter (also referred to as its efficiency) is listed in percentages.
  - They include 95%, 99% and 99.7%(which is referred to as 100%).
  - The higher the number, the greater the efficiency.
  - But remember, it is more difficult to breathe through higher rated filters, so do not use a higher rating than you need.
  
- **Talk to your supervisor to see which efficiency will best protect you at your work site.**
  
- **For easy identification, OSHA requires that all filters and cartridges:**
  - Be color-coded.
  - Include approved labels that display the NIOSH rating.
  
- **A cartridge respirator is not usually needed in areas where low levels of dust are the primary respiratory problem.**
  - Here a disposable mask can be used
  - Fibers in the mask trap and hold particles.

- **To get a proper fit:**
  - Adjust the metal strip to conform with the bridge of your nose.
  - Make sure the straps are not tangled.
  - Place one strap below the ears and the other above them (this creates an even tension on the mask and provides the best seal).
  
- **When your mask becomes clogged with dust, throw it away and get a new one.**
  
- **However, where more protection is required you will need to use an air-purifying respirator.**
  - These have disposable cartridge filters that capture gases and vapors through chemical means before they are breathed in.
  - Remember, before using any air-purifying respirator check with your supervisor to see whether you need to use a P, R or N series filter.
  
- **Whenever there is a high amount of dust or other particulates in the air, you may want to attach a pre-filter to your respirator.**
  - This traps the particles before they are absorbed by the cartridge filter.
  
- **You can get even more protection by using a full-face mask respirator.**
  - It will guard against hazards could irritate your eyes and skin.
  
- **Sometimes air-purifying respirators don't offer enough protection.**
  - In these situations you need an independent source of breathable air.
  
- **Supplied-air respirators (SARs) are attached to a compressor that provides air through a hose. They are used where:**
  - Hazardous substances are highly concentrated.
  - There isn't enough oxygen.

- **Another respirator that provides its own air is the self-contained breathing apparatus (SCBA).**
  - These allow for greater mobility than SARs, since the air supply is carried in a tank on your back.
  - An SCBA's breathing air usually lasts for 30 to 60 minutes, although newer designs allow for significantly longer periods.
  - How long your tank will actually last will depend on your weight and the stress that your job puts on your body.
  
- **Before you put on an SCBA, make sure the air tank is fully charged.**
  - Always check your air supply gauges.
  
- **Working with SCBAs and SARs can be stressful.**
  - When using them watch out for physical problems that may affect you and your coworkers.
  - For instance, it can be easy for someone who is wearing heavy equipment to tire quickly or be overwhelmed by heat exhaustion.
  
- **If you wear an SCBA to fight fires you must follow special procedures set up by OSHA.**
  - OSHA requires that at least two firefighters enter a "burning area".
  - They must remain in visual or voice contact with each other at all times.
  - At least two responders must also be stationed outside the danger zone.
  
- **Whatever type of respirator you wear, check all of its parts before putting it on.**
  - Look for wear or damage.
  - Inspect for holes.
  - Make certain all connections are tight.
  - Examine the straps and the seal of the face-piece.
  
- **At least twice a year you should also have your safety department check you for a proper fit.**
  - Even a tiny gap can let in hazardous gases and vapors.

- **Whether your job requires you to wear SCBAs, cartridge respirators or dust masks, OSHA mandates that your employer create a written "Respiratory Plan."**
  - This outlines the respiratory requirements of the jobs at your work site.
  - The plan has to be readily accessible to you and your coworkers.
  - Your employer will periodically review the plan to ensure that it is up-to-date with current OSHA and NIOSH regulations.
  
- **OSHA also requires your employer to arrange a medical evaluation for you before you wear a respirator.**
  - The evaluation will be conducted by a licensed healthcare professional.
  - It will determine whether you can safely use a respirator.
  
- **When you select a respirator, pick one that conforms to your face.**
  - Your employer will have at least three different sizes to choose from.
  - Make sure the mask is comfortable.
  
- **Your employer will show you how to correctly position and adjust the mask for an effective seal.**
  - The straps should not have to be pulled uncomfortably tight to keep the mask in place.
  - The mask does need to fit snugly however, since the seal blocks contaminants from reaching your respiratory system.
  
- **There must be no gaps between the respirator and your face.**
  - Standing in front of a mirror is a good way to check for openings.
  
- **Even after fitting and testing, your respirator may still feel bulky and awkward.**
  - Getting used to one takes time.
  - If you practice wearing your respirator at least five minutes a day you will soon be comfortable with it.

- **When you wear your respirator, make sure that you can be understood when you speak.**
  - Test this by reading something aloud to your supervisor.
  - When you are in a hazardous environment, never remove your mask to talk (this could be fatal).
  
- **OSHA also requires all employees to undergo a formal "fit test" before they wear a respirator.**
  - Fit-testing ensures that the respirator really does fit tightly against your face.
  
- **There are two types of fit-testing:**
  - Qualitative.
  - Quantitative.
  
- **Qualitative testing uses scented chemicals or smoke sprayed into the air.**
  - If you can't smell the chemicals, you probably have a good fit.
  - The problem with qualitative testing is that it is subjective, since it relies on each person's sense of smell.
  
- **Quantitative testing is much more accurate.**
  - This uses a machine to measure the exact amount of material that makes its way into your respirator.
  
- **Even after the qualitative or quantitative fit tests have been performed, you should still test your respirator's seal each time you wear it.**
  - This can be done by performing a "User Seal Check", which uses both positive and negative pressure to test how well the respirator seals to your face.
  
- **To check the seal using positive pressure:**
  - Place the palm of your hand over the exhalation valve of the respirator.
  - Gently breathe out.
  - If you feel a build-up of pressure beneath the mask, and see the side of the face-piece bulge out slightly, you have a good seal.

- **To check the seal using negative pressure:**
  - Place both hands over the inhalation valves and breathing in gently.
  - The face-piece should collapse slightly against your nose.
  - Hold your breath for 10 seconds.
  - If the mask stays collapsed, you have a good seal.
  
- **You must perform "User Seal Checks" every time you wear your respirator.**
  - This is to insure that nothing has happened to change the way it seals to your face.
  
- **There are several types of problems that could affect the seal, including damage to parts of the respirator such as the face-piece.**
  
- **Even certain changes to your face can affect how your respirator fits.**
  - For instance, facial hair, including long sideburns, can interfere with a mask's ability to form a tight seal.
  - Dentures, scars and other physical impairments on the face can affect face-piece seals as well.
  
- **Eyeglasses can also affect respirator seals.**
  - If you wear glasses and use a full-facemask respirator, you will need to install a NIOSH-approved "eyeglass modification kit".
  - After installing the kit you must fit-test the respirator again.
  
- **Be sure to talk to your supervisor or your medical department if you wear glasses and need to wear a full-facepiece respirator.**
  - Your safety depends on it.
  
- **Proper care of your respirator is essential.**
  - Following recommended cleaning and disinfecting procedures will keep your respirator... and you... in good working condition.

- **The OSHA-approved cleaning procedure begins with removing all filters, cartridges and canisters.**
  - Next, remove the straps.
  - If your respirator uses hoses, check them for defects.
  - Check all valve assemblies too.
  - If you find any defective pieces, repair or replace them immediately!
  
- **Wash all parts of the respirator in warm water, using a detergent recommended by the manufacturer.**
  - If you need to remove dirt, use a stiff bristle brush.
  - Never use a wire brush, however (it could seriously damage your respirator).
  
- **Once you have washed everything, thoroughly rinse all of the parts with warm running water.**
  - When the dirt is gone, do not forget to rinse away all of the detergent.
  - Detergent residue can dry and crack rubber, and corrode metal.
  
- **Hand dry all of the pieces with a lint-free cloth.**
  - Reassemble the respirator and test it.
  
- **Respirators worn by only one person should be cleaned on an "as needed" basis.**
  - Respirators used by two or more people should be cleaned and disinfected after each use.
  
- **Respirators that are used for emergencies should also be cleaned and disinfected after each use.**
  - Respirators used for training purposes need to be cleaned and disinfected after each use, as well.
  
- **There are hazardous substances, like lead and asbestos, that require extra cleanup procedures.**
  - Consult your supervisor if you are working with these materials.

- **When you are through cleaning your respirator:**
  - Put it in its case.
  - Store it in a clean, dry place.
  - This way it will be ready to go the next time you use it.

**\* \* \* SUMMARY \* \* \***

- **Respiratory hazards exist all round us, do your part to combat them!**
- **Be aware of possible respiratory problems in your workplace.**
- **Read Material Safety Data Sheets and be on the lookout for other indications of respiratory hazards.**
- **Use ventilation equipment and environmental controls to reduce airborne contaminants.**
- **Wear respirators when necessary, and make sure you follow the OSHA and NIOSH regulations regarding selection and use of filters.**
- **Before you use a respirator, get fit-tested.**
- **Use recommended cleaning and disinfecting practices to keep your respiratory equipment in working order.**
- **When it comes to respiratory safety, always use the right "tool" for the job, to make sure that you are breathing safe, clean air... every day!**