RESPIRATORY SAFETY

General Awareness

FACILITATOR’S GUIDE
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Every day there is a person who puts their own life at risk to save another or to perform their daily job tasks. No matter what your occupation may be, there are always dangers that could put you at risk of injury. Knowing and understanding what hazards may be involved with activities performed at your site, and trying to eliminate those hazards, can help ensure the safety of yourself and your co-workers. When airborne hazards cannot be eliminated the correct respirator must be used. Your awareness of possible risks that may be associated with airborne hazards, and the proper selection and use of respirators, is a necessity for the safety and health of everyone involved.
Getting Started

Training Materials

Collect all of the necessary materials and supplies before training begins. Here are some suggested materials and supplies:

• A training location that is free of distractions, has good lighting, and a comfortable temperature.

• Desks and chairs arranged so that everyone will be able to see the viewing screen, the facilitator, and each other.

• The video, a VCR, and a TV with a remote. Make sure the video is rewound.

• An employee handbook and pen/pencil for each trainee. Each handbook includes a quiz at the back, which can be used to test comprehension and document training.

• Other supplies and equipment you may need - blackboard chalk, paper, handouts, transparencies, overhead projector, markers, notepads, etc.

• Additional information, such as a copy of the regulation or other reference tools.
Preparation

A successful presentation requires preparation and planning. Give yourself several days before the training session to get organized.

- Locate and schedule the training site as soon as possible.
- Notify trainees of the training date and time, the training schedule, and proper dress.
- Obtain all necessary equipment and supplies.
- Make sure you know how to operate the TV, VCR, and other equipment. Check to ensure that it is working properly. Replace or repair any damaged equipment.
- Prepare your presentation, including a lesson plan or outline of the training. Include the training goals and objectives. Some presentation guidelines are included on the next page. A sample lesson plan has been included on page f of this Facilitator’s Guide.
- A day or so before conducting the training session, you may want to have participants take the quiz as a pre-test. The results of this test can help you to determine weak areas to focus on during the training session.
- Preview the videotape. Note any key points you want to expand upon in your training.
Presentation Guidelines

How you present the training course can have a great impact on learning. By following these simple presentation guidelines and keeping your objectives in mind, you can effectively and efficiently get the most out of your training session.

Organize Training Time Efficiently
In today’s busy work climate it can be difficult to find the time needed for training, so it is important to be organized and well-prepared when you do schedule training sessions. Whether you use Summit’s suggested lesson plan or not, it is important to have a lesson plan prepared that you can implement comfortably. This ensures that time spent in training is productive and beneficial for everyone.

Stress the Purpose and Goals of Training
Training needs to be goal-oriented. State the purpose of training in a clear, specific manner - whether it’s to reduce injuries, increase production, improve quality, improve working conditions, etc. Review the goals and objectives of the training so trainees know what is expected of them.

Capture Their Attention
Training needs to be interesting and compelling to hold trainees’ attention. To help motivate learners, give them specific evidence that their effort makes a difference and provide feedback on their progress. Also, remember that the first experience with a new subject usually forms a lasting impression on the learner. By making that experience a positive one, you can help ensure your audience retains the information learned.
Make New Learning Experiences Pleasant

For some adults, past experiences with education were unpleasant and not helpful. Adults learn best when they feel comfortable. By making the learning environment open and friendly, you can help adults to feel secure in their new learning experience. Offer support and feedback as often as possible, and be ready to provide extra attention to those who may require it.

Ask If There are any Questions

When most adults learn new information that conflicts with what they already know, they are less likely to integrate those new ideas. It is very important to make sure participants fully understand the training and do not have any unresolved questions. Provide for a question and answer period so participants can resolve those questions and/or answer questions throughout the training session.
Lesson Plan

As a qualified trainer, your job is to effectively communicate a great deal of information in a well-organized manner. By preparing a lesson plan, you can ensure that each minute of the training session is productive. Summit has provided a suggested lesson plan for your use.

1. Program Objective
This guide reviews *Respiratory Safety: General Awareness*. In it, we will cover:

- Respiratory Hazards
- How Respirators Work
- Choosing The Right Respirator

2. Show the Video: “*Respiratory Safety: General Awareness*”

3. Discussion and Demonstration
To help relate the training to your site, you may wish to incorporate your own discussion topics and exercises. Key issues you might consider include:

- What types of tasks performed at our facility may require the use of respirators?
- Who is in charge of “fit testing” respirators?
- What is the difference between particulate respirators, gas and vapor respirators, combination respirators, supplied-air respirators, and self-contained breathing apparatuses?
- What are some possible consequences that may result if respirators are not used for tasks in which they are required?
4. Use Handbooks to Reinforce Training
The handbooks increase comprehension and reinforce the information learned in the video program by explaining the main points and expanding on the original material. For increased employee information retention, go over one section at a time and stop to answer questions. The quiz at the back of the Facilitator’s Guide is provided to document employee training. Answers to the quiz are provided on a separate page.

5. Questions and Answers
Provide for a Q&A session to answer any questions. It may be necessary to review some of the material when providing answers. The employee handbook, equipment manuals, and other reference tools may be helpful.
Frequently Asked Questions

How often do respirators need to be fit tested?
Respirators must be fit tested once a year, or after conditions occur such as facial scarring, dental changes, cosmetic surgery, or obvious changes in body weight. However, if you notice your respirator has been damaged or suspect that it is not sealing properly, you should turn the damaged respirator into your supervisor and have a new fit test performed.

What is the controlled negative pressure (CNP) REDON protocol and how is it performed?
The CNP REDON protocol is an improved fit-testing procedure established by OSHA. It consists of three test exercises which are followed by two redonnings of the respirator. The first exercise is facing forward. You will stand in a normal position and breathe normally for 30 seconds, without talking. Then, continue to face forward and hold your breath for 10 seconds to complete the test. The second exercise is bending over. In this test you will need to bend at the waist for 30 seconds and hold your breath for 10 seconds. The third test is called head shaking. This test requires you to shake your head back and forth vigorously several times while shouting for approximately three seconds. Then, face forward and hold your breath for 10 seconds to complete the test. Once these three tests have been performed, you need to do two redonnings. The first redonning requires you to remove the respirator, loosen all face-piece straps, then place it back on and readjust the straps for a proper fit. Once you have placed it back on, stand facing forward and hold your breath for 10 seconds. Next you will need to complete the second redonning. You will preform this redonning exactly as you did the first to be sure the respirator is fitted properly.
In many work environments, using proper respiratory protection is absolutely critical. That's why your facility, in accordance with government regulations, has implemented a written respiratory protection program.

The goal of the respiratory protection program is to put in place a state-of-the-art policy for protecting you from airborne hazards in the workplace. While it’s the role of our program administrator to oversee the program, to be effective, you must also do your part.

Why is an effective respiratory protection program so important? Human beings can absorb toxins through the skin and gastrointestinal tract... but due to our constant need for oxygen, the quickest and most direct route for toxins to enter the body is the respiratory system.

**REAL LIFE**

Lt. Steve Sandholm
Kentwood Fire Department

You are looking for fire, you are looking for people and it is dark. You cannot see your hand in front of your face and you depend on your equipment. You depend on your airpak to save your life; without it you would not be going in there. We crawl low. We teach people to crawl low to keep under the smoke, but still we would not be able to survive without that self-contained breathing apparatus. We use it every time we go on a fire call. It’s a necessary part of our job.
When oxygen is breathed into the lungs, it quickly passes into the bloodstream and circulates throughout the body. Unfortunately, if toxins are breathed in, they can enter the body along the same efficient route, causing damage every step of the way. Besides lung diseases such as asthma, bronchitis and emphysema, toxins that enter the bloodstream can aggravate or be the cause of nerve disorders, heart disease, brain damage, cancer or death—depending on the nature of the toxin and level of exposure.

“...a respirator is really important because you are standing in close proximity with a chemical...and when you are dropping your spinner in the tank with a chain hoist you are hovering, and all that vapor is rising up, and if you don’t have it on you are breathing it all in, so in my line of work it is absolutely a necessity for the kind of chemicals that we deal with.”

James Berger
Supervisor
Container Services Group, PSC
In the workplace, respiratory hazards can be divided into three categories: particulate contaminants, gas and vapor contaminants, and oxygen deficiency.

**Particulate Contaminants**
Particulate contaminants are very common in the work environment and can come in many forms. Sometimes they are visible to the eye, many times they are not. If allowed to enter the lungs they can cause a long list of acute and chronic illnesses.

**Dust**
Airborne dusts and fibers occur when solid materials are broken down during activities such as sanding, cutting, crushing, grinding or drilling.

**Mist**
Mists are liquid particles of various sizes, formed when liquid is sprayed, shaken, mixed or stirred.

**Fumes**
Fumes are minute, solid particles caused when metals and plastics are heated by welding, smelting, soldering or brazing operations.

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**REAL LIFE**

James Berger
Supervisor
Container Services Group, PSC

“We deal with a lot of hazardous chemicals that require respirators and if you don’t wear it, who knows what could happen... years and years of breathing in the kind of chemicals that we deal with--a lot of them are carcinogens, a lot of them.”
Fog
Fog is a mist concentrated enough to block your vision.

Smoke
Smoke is made up of gases, vapors, particles, and liquid aerosols that are produced by burning or chemical reaction. Smoke is often concentrated enough to block your vision.

Along with these hazards commonly found in manufacturing, there are biological particulates that agricultural and health care workers are exposed to, including airborne bacteria, viruses and mold.

Gases And Vapors
Gases and vapors are the second category of respiratory hazard that workers need to be aware of. Gases are materials that become airborne at room temperature, while vapors are formed when liquids evaporate. Like gases, vapors are often invisible. Once breathed into the lungs, they can easily enter the bloodstream and damage organs throughout the body.
When they enter these trailers, entering without a supplied-air respirator could potentially be fatal. They may be climbing into an atmosphere that is full of nitrogen, that is oxygen depleted, or where the atmosphere due to a chemical...would overpower them and possibly cause unconsciousness or death.

We have found over the years that overexposure to lead, overexposure to silica dust, overexposure to asbestos, or any exposure to asbestos can be devastating to a worker in his future years. And it’s a major problem.
Respiratory Hazards continued

Oxygen Deficiency
The third category of respiratory hazard in the workplace is oxygen deficiency – another invisible hazard. Normally the air we breathe contains an oxygen concentration of 20.9 percent by volume. If the oxygen levels in an atmosphere drop below 19.5%, drowsiness, asphyxiation, and death can occur. Particularly in confined spaces, the oxygen we need to survive can be displaced by other gases. The only way to know if this has occurred is to test an environment prior to workers entering that atmosphere.

“...We go through several different tests. We put on our masks and a machine is hooked up to our facepiece. We move our heads up and down several times...side to side...open and close your mouth...and read certain paragraphs. All this time it’s taking readings of the pressure inside our mask to make sure that it’s properly fit.”

Lt. Steve Sandholm
Kentwood Fire Department
Following the guidelines in the respiratory protection program, the management at this site has eliminated as many respiratory hazards as possible from the work environment and, where hazards could not be eliminated, respiratory protection has been selected. Before you can use this equipment, however, you must receive a medical evaluation from a physician or health care worker. If you pass the medical screening you are then cleared to move on to the “fit test.”

James Berger
Supervisor
Container Services Group, PSC

“We are fit tested once a year to make sure...our respirator is sealing right.”

Jamie Crouch
Safety Officer
Metropolitan Hospital

“The seal to the respirator is so important because if you do not ensure that you have the proper seal, whatever you are trying to protect yourself against will seep through the respirator.”
There are two basic types of respirators: air-purifying respirators and atmosphere-supplying respirators. The respirator you will need depends on the type of hazards you will be exposed to and the type of work you will be performing.

**Air-Purifying Respirators**

There are three types of air-purifying respirators:

- particulate
- gas and vapor
- combination

Air-purifying respirators allow contaminated air to pass through a cartridge or filter to eliminate toxins from the air you breathe in. They are lightweight and mobile, but also have limitations. Air-purifying respirators should not be used in oxygen deficient environments or when contamination levels are too high for filters and absorbents. Since air-purifying respirators...
respirators do not supply oxygen, an atmosphere-supplying respirator should be used in these types of situations.

**Atmosphere-Supplying Respirators**

There are two types of atmosphere-supplying respirators:

- supplied-air respirators
- self-contained breathing apparatus or SCBAs

Atmosphere-supplying respirators supply breathable air from a source that is different from the contaminated air. Atmosphere-supplying respirators are meant for working in higher-risk environments classified as immediately dangerous to life and health, or IDLH.

**REAL LIFE**

Lewis Wiedewitsch  
EHS Engineer, Citation Corp.

"Life is about choices. You have the choice to wear a respirator or not. You have the education...the experience...and now the knowledge of why and how a respirator works. Remember, the life you save by wearing a respirator might be your own."
These types of respirators also have limitations. The user has limited mobility because they are either tethered to an air hose, or have to carry an air tank on their back that will supply them with clean air to breathe. Since the air hose that is used with a supplied-air respirator could be damaged or punctured, a small auxiliary tank needs to be attached for emergency purposes when working in an IDLH atmosphere. This emergency tank will provide the user with enough time to escape the hazardous breathing environment unharmed if an emergency situation arises.

Choosing The Correct Respirator

How is the correct respirator chosen? First, the air is sampled and analyzed to determine which toxins are present and at what levels. Where there is the potential for an atmosphere to be oxygen deficient, oxygen levels must also be determined. Once this information is gathered, the capacities and limitations of various respirators must be considered before a final decision is made.
Remember, our goal is to create the safest possible work environment for our employees. If you have any questions about respirator use, care or storage, ask your supervisor or program administrator.

While the problem of airborne toxins in the workplace is a serious one, all these hazards can be minimized or eliminated. The respiratory protection program provides a set of guidelines that every employee must follow to keep themselves and their co-workers safe while on the job.

REAL LIFE

Jim Stanley
President
FDR Safety
(former Deputy Assistant Secretary of Labor, OSHA)

“Regardless of whether you’re uncomfortable, regardless of whether it slows you down, regardless of whether it is something you don’t want to do...you have to do it because so many other people depend on you staying healthy and staying safe.”

John Waller
Director of Safety and Health
Container Services Group, PSC

“Exposure to things may not be an issue right now, but 20 or 30 years down the road may severely impact your life and your quality of life.”

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Quiz

To review your knowledge of *Respiratory Safety: General Awareness*, answer the questions below.

Your Name          Date

1. Particulate contaminants are always visible to the human eye.
   a. True   b. False

2. What type of particulate contaminants are likely to be found in a work environment where sanding, cutting, crushing, grinding, or drilling is being performed?
   a. Airborne dusts and fibers
   b. Mists
   c. Fumes
   d. Smoke

3. Agricultural and health care workers are never exposed to any types of airborne particulates.
   a. True   b. False

4. What type of materials become airborne at room temperature?
   a. Fibers
   b. Dusts
   c. Gases
   d. None of the above

5. Confined spaces must always be tested for air contaminants before workers enter that atmosphere.
   a. True   b. False
6. Air-purifying respirators must be used in oxygen deficient atmospheres like confined spaces.
   a. True  b. False

7. What type of respirator is required for high-risk environments classified as immediately dangerous to life and health?
   a. Air-purifying respirator
   b. Paper dust mask respirator
   c. A handkerchief over the nose
   d. Atmosphere-supplying respirator

8. What must you do before you can be cleared to move on to a “fit test”?
   a. Lose some weight
   b. Get parental permission
   c. Pass a medical screening
   d. Study really hard

9. Who should you ask if you have any questions regarding respirator use, care, or storage? Select all that apply.
   a. Your supervisor
   b. Your program administrator
   c. Receptionist
   d. Don’t ask, just go with your first instinct

10. REAL LIFE: A fireman receives a call that everyone is sick at a house downtown. What should the fireman do BEFORE entering the house? Select all that apply.
    a. Perform the secret knock on the door and walk in
    b. Test the air
    c. Put on a SCBA
    d. There is no time to wait; he should just walk in with no personal protective equipment.
Quiz Answers

1. b  False
2. a  Airborne dusts and fibers
3. b  False
4. c  Gases
5. a  True
6. b  False
7. d  Atmosphere-supplying respirator
8. c  Pass a medical screening
9. a  Your supervisor
   b  Your program administrator
10. c  Put on a SCBA