

## **Respirator Awareness Training**

## prepared for

U.S. Department of Energy
Office of Environment, Safety and Health (EH)
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#### prepared by

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#### RESPIRATOR AWARENESS TRAINING: TRAINING SURVEY

Date:		
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#### PRE-TRAINING SURVEY

Circle the word(s) that best describes your knowledge level about respirators.

- 1. I know *very little/ some/ a lot* about the use of respirators.
- 2. I know **very little/ some/ a lot** about the requirements of the OSHA Respiratory Protection Standard.
- 3. I know **very little/ some/ a lot** about appropriate respirator training requirements.
- 4. I know **very little/ some/ a lot** about respirator fit testing procedures.
- 5. I know *very little/ some/ a lot* about medical evaluation requirements.
- 6. I am **bothered/confident** about wearing a respirator to protect myself from airborne hazards.

## **Respirator Awareness Training**



#### **POST-TRAINING SURVEY**

Circle the word(s) that best describes what you have learned about respirators.

- 1. I learned *very little*/ *some*/ *a lot* about the use of respirators.
- 2. I learned **very little/ some/ a lot** about the requirements of the OSHA Respiratory Protection Standard.
- 3. I learned **very little/ some/ a lot** about appropriate respirator training requirements.
- 4. I learned **very little/ some/ a lot** about respirator fit testing procedures.
- 5. I learned **very little/ some/ a lot** about medical evaluation requirements.
- 6. I am *less bothered/ more bothered* about wearing a respirator to protect myself from airborne hazards.

#### Comments:



#### WHY WE ARE HAVING THIS TRAINING

#### **Background**

On January 8, 1998, the Occupational Safety and Health Administration (OSHA) published a revision to their requirements for respiratory protection programs. As a result, DOE EH-5 established a Respiratory Protection Committee to evaluate the impact of the new Standard.

As part of the evaluation, EH-5 sent a survey to EH personnel regarding their respiratory protection needs.

The results of the survey indicated that:

- 50% of the respondants were interested in attending training.
- 25% of the respondants anticipated the need to wear respirators.

The Committee concluded that:

- There are a number of EH personnel who wear respirators.
- EH personnel need a Respiratory Protection Program.
- There is a sufficient number of EH personnel interested in respirator training.
- EH personnel have the expertise to develop and provide the training.

## Regulations require Federal employees to be trained

Our primary objective for giving this training is to enhance your ability to protect yourself.

There is also a legal or regulatory basis for giving this training. Training is required for employees who wear respirators. This includes DOE-HQ personnel.

The OSHA Act requires the heads of all federal agencies, including DOE, to establish and maintain the Federal Employee Occupational Safety and Health (FEOSH) program.

One key aspect of the FEOSH program is that it must contain the program elements specified in Federal Regulation 29 CFR 1960, "Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters."



Among the program elements in 29 CFR 1960 is the requirement to provide appropriate health and safety training to Federal employees.

Another aspect of the FEOSH program is that it meet the safety and health standards promulgated by OSHA (29 CFR 1910 and others). Department requirements for occupational, safety, and health are also specified in DOE Order 440.1, "Worker Protection Management for DOE Federal and Contractor Employees."

With regard to respiratory protection, the Department requires adherence to the most protective aspects of the OSHA requirements in 29 CFR 1910 or those in ANSI Standard Z88.2.

Finally, the FEOSH program requires Federal employees to comply with the standards, rules, and regulations issued by their agency in accordance with FEOSH requirements and that Federal employees use safety equipment, personal protective equipment, and other devices and procedures provided or directed by the agency and necessary for their protection.

Thus, this course is being provided to meet EH's responsibility in the area of respiratory protection under the FEOSH program. It is intended as an awareness level course. For those employees who actually wear respirators, additional training is required.

#### **Terminal Training Objectives**

Upon completion of this training, you should be able to:

- List reasons why respiratory protection is needed.
- Describe when and where respiratory protection might be required.
- List the elements of a Respiratory Protection Program.
- Describe EH personnel responsibilities pertaining to a Respiratory Protection Program.
- List points of contact and information on Respiratory Protection Programs at HQ and throughout field offices.



#### **Awareness Exercise**

- **T F** Facial hair, earrings, and eyeglasses can decrease the protection offered by respirators by breaking the seal around the ear.
- **T F** Respiratory protection equipment worn incorrectly is like wearing none at all.
- **T F** Respirators should be the first choice in controlling worker exposure to hazards.
- **T F** You will need respiratory protection when working with high concentrations of airborne radioactive materials, highly toxic chemicals in the air, or high levels of dust, as determined by the hazard assessment.
- **T F** The elements of a respiratory protection program can include hazard assessment, written program, selection and maintenance of respirators, medical evaluation, fit testing, and training.
- **T F** Employees have the right to refuse to wear a respirator without medical evaluation and/or fit testing.
- **T F** Employees can expect Site respiratory program administrators to contact them whenever they go out to the Site.



Upon completion of this section, you should be able to:

- Define what a is respirator.
- Explain why you should wear a respirator.
- List the types of respirators.
- Explain when and where respirators should be worn.
- Describe who can wear a respirator.
- Describe how respirators should fit.
- Explain why respirators are not perfect.

#### WHAT A RESPIRATOR IS

A respirator is a device that protects you from airborne hazards. It filters the air in the work area or supplies clean air from outside the work area.

Some respirators have filters that sort out particles, gases, and vapors from the air. Other respirators provide breathable, fresh air or oxygen from an outside source.

#### WHY YOU SHOULD WEAR A RESPIRATOR

Your employer has a responsibility to make the workplace safe. Making changes in the workplace and using safe work practices are sometimes not enough. You may need to wear protective clothing and respirators to protect yourself.

Generally, respirators are required when engineering and/or administrative controls have not adequately reduced the amount of airborne hazards. When worn correctly, respirators can protect you from these hazards.

It is important to note that respirators are the least preferred method of controlling airborne hazards, and they should not be used as the only means to prevent or minimize exposures. Respiratory protection requirements are not an acceptable substitute for adequate training, supervision, appropriate engineering controls, and environmental or medical monitoring.

Respirators, in essence, are your last line of defense.

#### **TYPES OF RESPIRATORS**

Respirators fall into two big groups:

- Air-purifying
- Supplied-air



#### **Air-Purifying**

Simply stated, air-purifying respirators filter the air already in the room. They help to prevent you from inhaling (breathing in) airborne particles, gases, and vapors. Below is a list of some of the different kinds of tight-fitting, air-purifying respirators.



#### Half-Mask, Air-Purifying Respirator

A half-mask (half-face), air-purifying respirator is one of the simplest respirators you may use. The bottom of the facepiece (the wide part) goes under your chin. The top of the facepiece (the narrow part) goes over your nose.

This respirator works by negative-pressure. When you inhale, your lungs and heart work to pull air through the filters. This makes a suction, or negative pressure, inside the mask. Breathing through a negative-pressure respirator can take a lot of effort. The facepiece has to fit perfectly on your nose, cheeks, and chin. It has to form an airtight seal. If your respirator does not fit perfectly, air will leak in around the edges of the mask. Remember, a respirator is only as good as its fit!



#### Full-Face, Air-Purifying Respirator

A full-face, air-purifying respirator is another example. It fits the same way as a half-mask, except the top of the facepiece goes all the way around your face and across your forehead. It is also a negative-pressure respirator. When you inhale, it makes a suction, or negative pressure inside the facepiece. The facepiece has to fit perfectly on your forehead, the sides of your face, and your chin. If it does not form an airtight seal, air will leak in around the edges of the mask.



#### Powered Air-Purifying Respirator (PAPR)

A powered air-purifying respirator (PAPR) is another example. It looks like a negative-pressure respirator with an air pump. It has filters or cartridges. The air pump and filters can be on a



belt or on the facepiece. The pump pulls the air through the filters. It blows the air through a hose into the mask.

Because it has an air pump, this respirator is called a powered air-purifying respirator (PAPR).

The air coming through the hose pushes air away from the sides of the mask. This is a positive-pressure respirator. The air pump makes a positive pressure inside the mask. One good thing about a positive-pressure respirator is that if it leaks, it leaks out. Airborne particles, gases, and vapors are not supposed to leak in. Because a PAPR is powered with a pump, your lungs do not have to work so hard to pull the air through the filters. The air pump does some of the work. But if the batteries are low, a PAPR is no better than a negative-pressure, full-face respirator. It becomes a negative-pressure respirator and air can leak in around the sides of the mask.

The PAPR blows air at the same rate no matter how hard you breathe. If you breathe in too hard, it makes a suction, or negative-pressure, inside the facepiece. This is called overbreathing the respirator. The facepiece has to fit perfectly on your forehead, the sides of your face, and your chin.

#### Filters for Air-Purifying Respirators

Air-purifying respirators clean the air that is already in the work area by using filters. Air-purifying respirators will always have particulate filters called "high efficiency particulate air" (HEPA) filters or chemical cartridges.

You must have the right filters or cartridges for the job. The type you use depends on the type of hazard you need to protect yourself against. There are many kinds of filters and cartridges. A HEPA filter will capture particulates and dust. A chemical cartridge will capture gases and vapors.

Sometimes it is necessary to wear a combination or "stack" filter. These special filters have both a HEPA filter and a chemical cartridge.

Filters and cartridges are sometimes color-coded according to the hazard for which they are used. There is no standard to regulate color-coding. It is important to read the information on the filter/cartridge itself—not just look at the color—to see if you have the right one for the hazard.



Filters and cartridges need to be changed whenever it becomes difficult to breathe, when you can smell or taste the air coming through the mask, or when they get wet.

#### Limitations of Air-Purifying Respirators

Once again, air-purifying respirators filter the air being inhaled. The filters can become clogged and make it difficult to breathe. The respirators may also restrict your vision and limit your communication.

Some respirators (such as half-mask respirators) may protect you from inhaling hazardous airborne particles, gases, and vapors, but they do not offer eye protection.

Also, you cannot wear your regular glasses with some kinds of air-purifying respirators such as a full-face respirator. The side bars of the glasses can break the seal of the mask. The mask will not fit tightly on your face. Special eye glass inserts are available for you to wear when using a respirator.

If you have a beard, you cannot wear a tight-fitting respirator. If your face is unshaven where the respirator seals, the respirator will not protect you. Even a large mustache can break the seal of your respirator.

Never use an air-purifying respirator if there is not enough oxygen in the work area. Air-purifying respirators are not for use in atmospheres containing less than 19.5 percent oxygen. They are not for use in atmospheres which are immediately dangerous to life or health (IDLH). They are also not for use against gases and vapors with poor warning properties unless equipped with an end-of-service life indicator.



### **Supplied-Air Respirators**

Supplied-air respirators are very different from the air-purifying respirators mentioned previously. Supplied-air respirators provide fresh air or oxygen through a hose from a tank or compressor. Examples of supplied-air respirators include airline respirators and self-contained breathing apparatus (SCBA), generally used in firefighting.



Supplied-air respirators are used when air purifying respirators do not provide enough protection, when there is too little oxygen in the area, or in situations which are IDLH.

#### Limitations of Supplied-Air Respirators

Supplied-air respirators also have their limitations. An airline can pose a tripping hazard or get caught on equipment in the area. If the hose gets damaged, your air supply may get cut off. Also, the airline can only extend so far.

With SCBAs, you are limited by the amount of air that is in your tank. Also, when using an SCBA, you carry your air tank on your back; therefore, you may be "too large" to fit into tight, small places.

#### WHERE AND WHEN RESPIRATORS TYPICALLY ARE WORN

There are many kinds of respirators. Which respirator you wear depends on the amount of hazardous airborne particles, gases, and vapors in the air. To determine this, your employer must do air sampling or other evaluations of the potential for air contaminants. Based on these samples or evaluations, he or she decides what kind of respirators are needed.

Areas requiring respirators (either being worn or carried) vary greatly from Site to Site. Some Sites extensively use respiratory protection. (The Fernald Site issued respirators 41,000 times last year).

Respirators are typically worn if there is a potential to be exposed to toxic particles, gases, or vapors or high concentrations of particulates (e.g., heavy dust). Some examples of where these toxic substances may be found include hazardous waste sites, chemically contaminated buildings, chemical spills, handling hazardous chemicals, activities involving grinding and sawing, and emergencies involving chemicals.

Also, respirators are typically worn in Radiological Areas such as, Airborne Radioactivity Areas, High-Contamination Areas, areas with transuranic contamination (e.g., plutonium areas), and areas with activities that may cause radioactive material to become airborne.



Supplied-air respirators should be worn in oxygen deficient areas. These areas are defined as having less than 19.5% oxygen. Oxygen deficient areas can be found in confined spaces such as silos, boilers, tanks, and sewers.

Additionally, Sites may have requirements already in place for the use of respirators in certain areas.

Contact Site personnel (DOE or contractor) prior to your visit. Discuss the purpose of your visit and locations where you may need to go. Ask them about respirator protection requirements for entering these areas (i.e., Are devices required to be worn or carried?).

In all cases, refer to a safety and health professional (industrial hygienist, health physicist, certified safety professional), for a hazard determination and proper respirator selection before donning (putting on) a respirator.

#### WHO CAN WEAR A RESPIRATOR

The OSHA Standard and ANSI Z88.2 say that you must have a medical evaluation before wearing a respirator. The OSHA Standard and ANSI Z88.2 also say that before you can wear a respirator, you must receive training and, for a tight-fitting respirator, a fit test.

Some people need special respirators. You may need a special respirator if you have:

A broad face Glasses
A broken nose Dentures
A very narrow face Large scars
A medical condition Missing teeth

A face with an unusual shape

If you need a special respirator, your employer must provide one for you.

Respirators may make it hard to breathe. You need to have a medical evaluation to be sure that your lungs and heart are strong enough to take the strain of working with a respirator.

You need a medical evaluation before you wear a respirator on the job. Your doctor may require you to wear a special respirator if you have problems with your lungs.



If you feel very anxious, a little faint, or shaky when you first try on a respirator, you may not be able to wear a respirator. You may want to try on the respirator a second time to be sure.

#### **HOW A RESPIRATOR SHOULD FIT**

Regardless of the type of respirator you wear, you are responsible for checking the fit, the wearing comfort, and defects such as holes, cracks, etc. Report any defects.

Some people have a hard time finding a respirator to fit their face. If you have a beard, you cannot wear a tight-fitting respirator. If your face is unshaven where the respirator seals, the respirator will not protect you. Even a large mustache can break the seal of your respirator. If you have a beard or a mustache that interferes with the fit of a respirator, you must shave.

If you wear a respirator that does not fit you, air and airborne particles, gases, and vapors will leak in around the sides of the mask. Instead of being caught in the filter, these particles, gases, and vapors will go into your lungs. This is why the law says you must have a fit test. A fit test tells you if the respirator is sealed around your face.

A respirator that does not fit looks the same as one that does. There is no way to tell if a respirator protects you just by looking at it. This is why it is important to perform a fit check (as discussed later) each time you wear a respirator.

#### WHY RESPIRATORS ARE NOT PERFECT

As mentioned, respirators may be necessary to protect your lungs from airborne particles, gases, and vapors. Some people do not like to wear a respirator. Respirators are sometimes uncomfortable, hot, and heavy. They can block your sight and make seeing difficult. However, as uncomfortable as they may be, you still may need to wear these pieces of equipment to protect yourself.

Each type of respirator has its good and bad points. Some respirators protect you more than others.

Each respirator has a protection factor (PF). A respirator's protection factor is a measure of how well it should protect you. Protection factors go from 10 to greater than 1,000. You will



not get the amount of protection assigned to a respirator unless it fits and is used properly. The higher the PF, the more a properly used respirator protects you.

Remember, respirators are the least preferred method of controlling airborne hazards, and they should not be used as the only means to prevent or minimize exposures.



Remember these Do's and Don'ts around respirators:

- Do ask the respirator program administrator if you are not sure which respirator to wear or how to wear or maintain it.
- Do make sure you have a good fit.
- Do get to fresh air immediately if you begin to smell or taste the chemical—your respirator is not working properly.
- Don't leave your respirator upside down or uncovered. Keep it clean.
- Don't use the wrong filter/cartridge.



Upon completion of this section, you should be able to:

- Explain what your employer has to do before giving you a respirator.
- List the elements of a Respiratory Protection Program.

## WHAT YOUR EMPLOYER HAS TO DO BEFORE GIVING YOU A RESPIRATOR

Before your employer hands you a respirator, he or she has to do a lot of things. They have to determine if you can wear a respirator. Who will choose the respirator? Who will maintain it?

The two standards that apply to respiratory protection (29CFR 1910.134 and ANSI Z88.2), require your employer to develop a written respiratory protection program.

#### **ELEMENTS OF A RESPIRATORY PROTECTION PROGRAM**

Employers who are required to provide respirators must have a written Respiratory Protection Program administered by a suitably trained program administrator. Following is a list of the elements that must be included in the program.

A Respiratory Protection Program must be administered by a suitably trained administrator.

Your employer must assign someone to be in charge of the respirator program. Find out who this person is. He or she can help if you have a problem with your respirator.

A Respiratory Protection Program must have written worksite-specific procedures.

Get a copy of these procedures from the person in charge of the program.



## A Respiratory Protection Program must provide a hazard assessment.

Your employer has to sample the air for airborne hazards. He or she will choose your respirator by interpreting the air sample results. Your employer must choose a respirator that will protect you from the hazard. A gas/vapor filter will not protect you from dust/particles. A dust/particle filter will not protect you from a gas/vapor. An air-purifying respirator will not protect you if there is not enough oxygen in the area.

A Respiratory Protection Program must provide you a medical evaluation.

Your employer has to provide a medical evaluation for everyone who wears a respirator.

fit testing.

A Respiratory Protection Program must include

Your employer must be sure your respirator fits you.

Quantitative and qualitative fit tests are performed at least annually on each respirator you are approved to wear.

Negative and positive fit checks are performed every time you put on a respirator.

A Respiratory Protection Program must include procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.

Your employer must check respirators and repair them. If there is anything wrong with your respirator, your employer has to



repair it before you can wear it. Your employer has to have trained people repair your respirator. Your employer also has to provide you a clean, dry, and safe place to store your respirator.

#### A Respiratory Protection Program must provide training.

Before you put on a respirator, you have to be trained. You need training on each respirator you use. You have to learn how your respirator works. You need to know what a respirator can and cannot do for you.

Fit testing is a formal procedure that must include instructions on:

- how to don (put on) and doff (take off) the respirator,
- how to check the fit or seal of the respirator, and
- how to select a respirator that fits and feels comfortable.



A Respiratory Protection Program must require the use of approved respirators and filters.

Respirators and filters have to be approved by the National Institute for Occupational Safety and Health (NIOSH). The NIOSH seal is generally imprinted on approved respirators and filters.

## A Respiratory Protection Program must be evaluated regularly for the effectiveness of the program.

The respiratory protection program must be evaluated regularly to ensure it is being properly implemented. You should also be consulted to ensure you are using your respirators properly.



Upon completion of this section, you should be able to:

 Describe your responsibilities pertaining to DOE-HQ-EH's Respiratory Protection Program.



#### WHAT EH EXPECTS FROM YOU

EH Headquarters Federal employee responsibility for participating in a Respiratory Protection Program falls mainly into three areas of the program elements:

- Medical evaluation
- Training
- Fit testing

#### Medical evaluation

It is required that you have a current physical (in accordance with ANSI Z88.6) prior to wearing a respirator. Some Site contractor personnel may not be required to have a physical in order to be issued some types of respirators (i.e., self-rescuers under the Mine, Safety, and Health Administration rules).

Most Sites will provide a medical evaluation and will accept documentation from other Sites. The Site program should define for what length of time a physical is valid.

You can get a physical at the DOE Germantown (3-4275) or Forrestal (6-9765) health unit.

Prior to traveling to a Site, contact the Site's Respiratory Protection Program administrator to determine their Site's requirements.

#### Training

It is required that you have current training prior to wearing a respirator. Depending on the Site, training can range from less than an hour to eight hours.

Training is typically provided on most working days. Most Sites will accept documentation of applicable training from other Sites.

## **Respirator Awareness Training**



Prior to traveling to a Site, contact the Site's Respiratory Protection Program administrator to determine their Site's requirements.

#### Fit testing

It is required that you have a fit test prior to wearing a tight fitting respirator. (Remember, you need a current physical to wear a respirator).

Fit testing is generally scheduled to follow training and is typically provided on most working days. Most Sites will accept documentation of applicable fit tests from other Sites.

Prior to traveling to a Site, contact the Site's Respiratory Protection Program administrator to determine their Site's requirements.



# Checklist of Respiratory Protection Topics to Discuss Before Going Out in the Field

- Typically, HQ personnel need to make a call to determine other types of access requirements, i.e., security access, radiation worker training, HAZWOPER, etc. Before going to the field location, contact the DOE or contractor point of contact and discuss:
  - Where are you going onsite? What will you be doing?
  - Have you been respirator qualified before?
     Current physical?.....will the Site accept?
     Current training? .....will the Site accept?
     Current fit test? .....will the Site accept?
  - How do you make arrangements for:

Physical? Training? Fit test?

- If you do not have a Site point of contact, the contractor Respiratory Protection Administrator may be able to assist you.
  - The EH-5 Respiratory Protection Homepage has a list for several Sites:

http://tis-nt.eh.doe.gov/whs/policy/respirator.html-ssi

### Appendix A

### **Programmatic Guidelines**

These written programmatic guidelines reflect current regulations and technology at the time of writing. New developments in regulations and/or technology may supersede these guidelines. Check with your organization's respiratory program administrator. These guidelines apply only to EH-5 Headquarters employees at this time.

**Written program** - This program shall be maintained by the Respirator Program Administrator in conjunction with the Federal Employee Occupational Safety and Health (FEOSH) Program. It will be made readily available to all who wear respirators.

**Hazard assessment** - Before wearing a respirator, a hazard assessment at the proposed workplace should have been performed. It is assumed that if a Site requires a DOE-HQ federal employee to wear a respirator, such an assessment has been done and documented, according to the OSHA Standard and ANSI Z88.2.

**Medical evaluation** - Where possible, medical evaluation for DOE-HQ employees will be done through the Headquarters Health Unit (following ANSI Z88.6). A written certificate shall be issued and should be acceptable at most field sites. When necessary, field sites may administer medical evaluations (following ANSI Z88.6), in lieu of the Headquarters Health Unit.

**Training** - All those wearing respirators must receive proper training according to the OSHA Standard and ANSI Z88.2. These training elements presently include:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- What the limitations and capabilities of the respirator are;
- How to effectively use the respirator in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, put on and remove, use, and check the respirator seals;
- The procedures for maintenance and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators;
- Proper donning and doffing, and
- When to change a cartridge.

This generic training should be reciprocal at all Sites. For any difficulties, contact your Respiratory Program Administrator.

Routine inspection, maintenance, storage, cleaning and disinfecting should be the responsibility of the field Site. The wearer is responsible for inspecting his respiratory equipment prior to and after its use. Such inspection could include cleanliness of the respirator, torn or loose straps, holes in the filter, broken or loose fittings, cracked or scratched facepieces, missing parts, etc.

**Selection** - All respirators will be NIOSH-approved and -certified. In most cases, the Site will provide the needed respiratory equipment.

**Fit testing** should, preferably, be done at the Site, using an OSHA Standard protocol and the Site-preferred respirators. If necessary, the Headquarters Respirator Program Administrator can arrange fit testing using a common respirator brand. Beards, low hairlines, glasses or goggles, and stubble may prevent proper user seal on a respirator. Quantitative fit testing is preferred. Fit testing must be done annually or more often as required by facial changes. Pressure tests should always be done before entering a hazardous atmosphere.

**Program evaluation** of the Headquarters Respiratory Protection Program should be conducted once a year by an independent party. Any guidelines used for field evaluations of respirator programs should be applied to the headquarters program as much as possible.

Voluntary use may be allowed under certain situations. Contact the Respirator Program Administrator.

#### Appendix B

### **Field Respirator Program Administrators List**

#### and

#### **DOE Safety Note**

## **Policy Points of Contact**

Joe Hopkins (301) 903-5619 joe.hopkins@eh.doe.gov

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Safety and Health Note Available at: http://tis-hq.eh.doe.gov/docs/sn/nsh9802.html

## Appendix C

## **Federal Occupational Safety and Health Contacts**

Available at: http://tis-nt.eh.doe.gov/feosh/contacts/poc\_list.html-ssi

## Appendix D

## **Medical Evaluation Questionnaire**

Available at: http://www.osha-slc.gov/OshStd\_data/1910\_0134\_APP\_C.html