Introduction

One of the principal routes by which chemicals can enter the body is through inhalation. If an individual is exposed to an excessive airborne concentration of a chemical over a long period of time, undesirable health effects can result.

The Occupational Safety and Health Administration (OSHA) has set permissible exposure limits for many airborne toxic materials. The Office of Environmental Health and Safety (EHS) can assist in determining whether a worker's exposure to chemicals with which he or she works exceeds these standards. If the permissible exposure limit is exceeded, the exposure must be reduced to acceptable levels through the use of engineering and/or administrative controls.

Engineering controls include the following:

- substitution with a less toxic material
- change in process to minimize contact with hazardous chemicals
- isolation or enclosure of a process or work operation
- wet methods to reduce the generation of dust, when applicable
- general dilution ventilation
- local exhaust, including the use of chemical fume hoods or other types of specialized ventilation systems

Administrative controls include employee training, use of standard operating procedures, and work scheduling to minimize the length of exposure.

Respirators and other personal protective equipment may be used where engineering controls are not feasible or cannot reduce exposure to acceptable levels, or while engineering controls are being installed. The need for a respirator is dependent upon the type of operations and the nature and quantity of the materials in use and must be assessed on a case by case basis.

Scope and Application

The use of respirators at the University of South Carolina Sumter is subject to prior review and approval by EHS. The OSHA Respiratory Protection Standard regulates any use of respiratory protection.

Any individual who has received approval by EHS to use a respirator, including self-contained breathing apparatus (SCBA), must be enrolled in the Respiratory Protection Program. A physical examination and health history review will be conducted by the Occupational Health Nurse at Thomson Student Health Center (USC Columbia) for medical approval and surveillance.

Respiratory protection, through the use of supplied air or self-contained breathing apparatus, is required for work in oxygen deficient atmospheres. It also may be necessary during non-routine operations in which the individual is exposed briefly to high concentration of a hazardous substance (e.g., maintenance or repair activities or during spill clean-up).

Program Description

The use of respirators is regulated by OSHA through the Respiratory Protection Standard (29 CFR 1910.134). The standard requires the development of a Respiratory Protection Program, including all of the elements described below.

Initial Hazard Assessment

If it is believed that respiratory protection is needed during the course of work in your department, notify SMT/EHS. An industrial hygienist from EHS will evaluate the potential hazards of the work and determine whether respiratory protection is needed. This may involve personal and area air sampling to measure exposure levels.

Written Respiratory Protection Program
If respirators are worn, your department should establish and maintain a written respiratory protection program covering all aspects of the use of respiratory protection. A model Departmental Respiratory Protection Program is available from EHS, or can be downloaded from the EHS website. This written program should be specific to your department and must include provisions for:

- identification and measurement of hazards
- respirator selection
- medical assessment
- training
- proper fitting of respirator
- respirator inspection and maintenance
- recordkeeping
- periodic program review

The written program must be reviewed and updated at least annually.

Respirator Selection

An EHS industrial hygienist determines the type of respirator needed (e.g., half-face or full-face air purifying respirator, powered air purifying respirator, supplied air respirator or self-contained breathing apparatus) based on the results of the initial hazard assessment.

When air purifying respirators are recommended, the appropriate type of filter or chemical cartridge is selected. Only respirators and supplies approved by the National Institute of Occupational Safety and Health (NIOSH) may be used at the University.

Your department is responsible for the purchase of the appropriate respirator and supplies.

Medical Surveillance

Prior to the assignment of respiratory protection, the individual must be evaluated by the Occupational Health Nurse to determine whether he or she is able to wear a respirator. This involves the completion of a medical history questionnaire, a limited physical examination and baseline laboratory testing. This may include a pulmonary function test, a chest x-ray, an echocardiogram, a urinalysis and a complete blood count.

The frequency of physical examinations and laboratory testing is at the discretion of the physician, based, in part, on age and general health.

Training and Fit-Testing

Individuals who require respiratory protection must receive training before using a respirator. The training is provided by EHS and includes discussion of the need for respiratory protection, the elements of the Respiratory Protection Program and the individual’s responsibility under it, the medical surveillance program, proper use of respiratory protection, respirator maintenance, and handling emergency situations.

Individuals required to wear respirators with tight-fitting face pieces must be fitted properly and tested for an adequate seal prior to use in a contaminated atmosphere. Qualitative fit-testing is performed by EHS. Instructions on performing positive and negative pressure checks are provided to respirator users so that they may check their respirator’s fit in the field.

SCBA users must show proficiency donning and doffing the respirator. It is imperative that they know how the SCBA functions and how to use it under varying conditions.

All employees using respirators must be trained annually and fit-tested annually.

Inspection and Maintenance
Respirator users are responsible for regular cleaning and inspection of their respirators, including looking for defects and missing parts. Respirators must be stored properly in order to protect them from dust, sunlight, excessive heat or cold, moisture and chemicals.

SCBA must be inspected at least monthly and a record of the inspection must be maintained. The department appoints an individual or group to be responsible for the monthly inspections.

An individual within the department should periodically spot check respirators to ensure they are in good condition.

Recordkeeping

For each individual assigned a respirator, the department maintains records of training, fit-testing, and respirator inspections. Medical records, including results of physical examinations, are kept by the Occupational Health Nurse at the Thomson Student Health Center.

Roles and Responsibilities

Department

- Recognize potential hazards and contact SMT/EHS for evaluation.
- Purchase respirators and associated equipment.
- Develop and implement a specific written Respiratory Protection Program.
- Notify SMT/EHS of new individuals requiring respiratory protection.
- Spot check respirators periodically.
- Conduct annual review of written program.
- Maintain inspection records of SCBA units.

Supervisors

- Recognize potential hazards and notify the department or SMT/EHS.
- Enforce the use of respiratory protection, where necessary.

SMT/EHS

- Identify and evaluate hazards.
- Select suitable respiratory protection options.
- Conduct initial and periodic training and fit-testing.
- Conduct initial and periodic practice sessions for SCBA users.
- Perform periodic reevaluations of exposures.
- Maintain records of fit-testing and training.
- Audit departmental program periodically.

Individual

- Recognize and report potential hazards to Supervisor.
- Use respiratory protection as instructed.
- Attend training and fit-testing annually.
- Contact EHS following each non-routine use of SCBA.
- Inspect respirator for defects or missing parts.
- Clean and store respirator as instructed.

For More Information

- Contact the EHS Industrial Hygienist at 777-4995
• Model written departmental Respiratory Protection Program
• Respiratory Protection Self-Audit Checklist
• Respiratory Protection Self-Audit Checklist Key