

# UCSD Respiratory Protection Program

## Administered by Environment, Health and Safety

### I. Introduction

It is the policy of the University of California, San Diego to maintain, insofar as it is reasonably within the control of the University to do so, an environment that will not adversely affect the health, safety, and well being of students, employees, visitors, and neighboring human populations.

Because of the potential risks involved from exposure to hazardous substances in the workplace, UCSD provides necessary respiratory protection equipment, and develops operational procedures for those employees who are required to use the equipment. All activities involving the use of respiratory protection equipment in facilities controlled by UCSD are conducted in compliance with Title 8 of the California Code of Regulations (CCR). The UCSD Respiratory Protection Program establishes procedures and requirements to meet various enforcing agencies' regulations for use of respiratory protection equipment, and provides the necessary health and safety protection to those persons falling within the jurisdiction of the program.

Your health depends upon breathing clean air. In some shops, vessels, labs, medical facilities, and maintenance environments the air may at times become contaminated with materials that are hazardous to breathe. The UCSD Respiratory Protection Program establishes guidelines for the use of respirators to protect the health of employees who, during their normal duties, are or could be exposed to hazardous substances or atmospheres.

### II. The Respiratory Protection Program

#### A. Hazards to the Respiratory System

Your body's respiratory system is constantly working to cleanse and purify the air you breathe. Some occupational activities and/or environments require the extra protection of equipment specifically designed to protect against hazards that may enter the body through the nose and mouth when a person breathes. Like clean air, many of these hazards that may enter the body through the nose and mouth when a person breathes. Like clean air, many of these hazards are invisible and odorless. Breathing (or respiratory) hazards include dusts, fumes, mists; gases and vapors; oxygen deficient atmospheres and temperature extremes. Knowing the characteristics of each hazard helps to understand why respiratory protection is so important.

***Dusts, Fumes, and Mists*** – are tiny particles that float in the air. *Dusts* are formed when solid materials are broken down in activities such as sanding, grinding, or crushing. *Fumes* occur when metal is melted, vaporized, then

quickly cooled, creating very fine particles that drift in the air – welding and furnace work are likely to produce fumes. *Mists* are tiny liquid droplets usually created by spraying, mixing, or cleaning activities. Mists may be a combination of several hazardous ingredients. When hazardous dusts, fumes, or mists are breathed in, they become trapped in the respiratory system causing irritation. Short – or long-term health problems may result, even death.

***Gases and Vapors*** – are invisible contaminants mixed in the air. *Gases* are substances that become airborne at room temperature. Gases are often produced by chemical processes and high-heat operations. They drift quickly and undetected from their source. *Vapors* are formed when liquids or solids evaporate, typically occurring with solvents, paints, or refining activities. Breathing hazardous gases or vapors irritates the respiratory system, causing either short-or long-term health problems, or even death.

***Oxygen Deficiency*** – a lack of oxygen in the air. Oxygen deficiency can be caused by chemical reactions, fire, or displacement by other gases. In confined spaces, where ventilation is very limited or non-existent, aerobic bacterial growth and oxidation of rusting metals can also cause an oxygen deficient atmosphere. Oxygen comprises only a small percentage, about 21% of the air we breathe. Yet, when levels of oxygen fall below 19.5% (minimal acceptable level), life-threatening health problems begin to occur very quickly. Oxygen deficiency is a very serious situation that can cause loss of consciousness or death in minutes.

***Temperature Extremes*** – extremely hot or extremely cold air can damage the respiratory system, depending on the length of exposure. Activities involving high-heat furnaces and walk-in freezers are subject to this hazard.

## **B. How the Program Works**

UCSD's Respiratory Protection Program is administered by the Office of Environment, Health & Safety (EH&S). The program endeavors to control occupational diseases caused by breathing contaminated air.

Job sites and tasks where workers may be exposed to breathing hazards are carefully evaluated by EH&S Industrial Hygienists using air-monitoring and measuring devices to determine what type of protection is needed, if any. EH&S has three approaches to achieving respiratory protection: The first method of protection is local engineering controls such as fume hoods or exhaust systems – the most effective and efficient means of protecting employees from on-site breathing hazards. Secondly, EH&S recommends administrative controls; these include substituting less toxic materials if possible, reassessing the task to see if exposure can be minimized or eliminated, and the possibility of job rotation to reduce the exposure of any

one person to acceptable levels. Third: when the first two methods are not feasible, not yet in place, or cannot provide adequate protection, personal protection equipment is necessary.

Employees requiring respirators are medically screened to identify any health reason that might prohibit or limit their use of a respirator. When medical clearance is received, the employee is fit tested to find the right size and type of mask for them. After a suitable respirator has been selected, they will learn how to properly use, clean, and maintain their equipment. Annual re-evaluations assure that the program is working.

### **C. Who Must Wear Respiratory Protection Equipment?**

Respiratory protection equipment is required:

- For activities that cannot be safely controlled by engineering methods (pesticide application, for example, require the portability of a respirator).
- When the working atmosphere is or may be oxygen deficient (confined spaces such as tanks, boilers, vaults, crawl spaces, and storm drains are examples).
- When airborne radioactive or toxic materials could exceed acceptable limits.
- For emergency use when loss of life or serious property loss or damage may be involved.

Only those persons who have been designated by their supervisor, principle investigator, or EH&S as being required to utilize respiratory protection equipment, and who have been medically approved, properly fitted, and trained in its use are authorized to utilize such equipment.

### **D. How Do You Obtain Respiratory Protection Equipment?**

Contact the Office of Environment, Health & Safety at x43660. An Industrial Hygienist will evaluate your workplace activities to determine the most effective and efficient means of respiratory protection for your circumstances. A respirator may not be necessary. If a respirator is indicated, you must satisfactorily complete a medical history questionnaire, respirator fit testing, and training on the use and limitations of the equipment. When these qualifications have been met, a new or cleaned and reconditioned respirator will be issued. These same requirements must be repeated annually. The appropriate type of respirator will be selected by utilizing the *Respiratory Equipment Selection Guide* and the American National Standards Institute-Practices for Respiratory Protection (ANSI Z88.2). The costs will be

recharged to the employee's administrative unit. *Procedures for Obtaining Respiratory Protection Equipment*, provides a step-by-step guide to the application procedure.

#### **E. Medical History Questionnaire**

Each employee whose duties require the use of a respirator will be asked to fill out a Medical History Questionnaire. Once it is reviewed and approved by the Occupational & Environmental Medicine, the employee will be scheduled for a respirator fit test and training. Employees who are medically denied will not be issued a respirator, and additional referral to the occupational health physician may be required.

#### **F. Education and Training**

Before a respirator is issued, EH&S provides instruction on the need for respiratory protection. Training includes a complete description of the equipment issued: its purpose and limitations, and how it works; how to wear and check the respirator for a good fit each time it is used; cleaning, storing, and maintaining it; how to inspect the respirator for damage or wear and recognize when it needs to be replaced. Pertinent State and Federal regulations, as well as campus policies, will also be discussed.

The length of these instruction sessions vary with the type of equipment being described. More time is needed to train personnel who may use equipment in IDLH atmospheres (atmospheres that are immediately dangerous to life and health) than would be necessary for nuisance dusts, which would be a minimal hazard.

#### **G. Procurement of Respirators**

EH&S evaluates and approves the purchase of respiratory equipment before it is used. Selection is dependent upon the type and concentration of the contaminant. Each air purifying respirator issued is equipped with a filter and/or cartridges for protection against specific contaminant(s). Criteria for the selection and fitting of respirators is in accordance with the Respiratory Equipment Selection Guide and the American National Standards Institute-Practices for Respiratory Protection (ANSI Z88.2).

Respiratory protection equipment such as powered air-purifying respirators, air-supplied sandblast hoods, air-supplied plastic hoods, and others, may only be purchased upon approval by EH&S. Emergency needs are also processed through EH&S.

### **III. Maintenance and Care Of Respirators**

#### **A. Respirator Maintenance and Care — The User**

Primary responsibility for maintaining the respirator in proper and clean condition rests with the employee.

- Before each use, inspect your equipment for defects, signs of wear, or damage. Make sure it is clean before you put it on.
- After each use, clean and disinfect your respirator with an alcohol wipe. Clean the inside first, then the outside, so exterior contaminants don't get inside the mask. Protect your respirator and cartridges from dirt and damage by storing them in sturdy plastic bags. Write your name on the bag.
- The life of a cartridge depends on these factors: the contaminant concentration, length of exposure time, and the user's exertion or breathing rate, manufacturer brand, temperature and humidity. Write the date on new cartridges so you'll know when you started using them. If the concentration is known, the manufacturer's database will provide the service life of the cartridges. When other methods for cartridge change schedule are not available, the rule-of-thumb for replacing cartridges is: if you detect any odor or taste of contaminant inside your mask, or if you experience difficulty breathing due to blockage of particulates on the filters, it's time to change cartridges. Cartridges have no expiration date as long as they are in the sealed package from the manufacturer.
- Inspect and examine all SCBA units at least monthly to ensure proper operation. Document the inspections.
- Return damaged respirators to EH&S in exchange for a new or reconditioned one. A respirator must be returned to EH&S if any of the following conditions are met:
  - o it is no longer needed
  - o it malfunctions or is damaged
  - o it becomes too difficult to breathe through the respirator
  - o the employee's employment at UCSD is terminated

#### **B. EH&S Maintenance Responsibilities**

EH&S will:

- disinfect and recondition respirators
- inspect valves, head straps and other parts, replacing them with new parts, if defective
- reissue reconditioned respirators
- conduct an annual survey of all SCBA units
- upon request, conduct annual training classes on SCBA inspection and training requirements for departmental personnel who may utilize SCBA units

If you have questions about respiratory hazards in your workplace, or about the respiratory protection equipment you have been issued, call EH&S at x43660.

#### **IV. Program Responsibilities**

##### **A. Principle Investigator, Supervisor, or Division Head**

Each person in charge of a research project or other activity where respiratory protection equipment is used is responsible for:

- Identifying, with the assistance of EH&S, those employees who may need respiratory protection equipment; scheduling them for medical evaluation, fit testing, and training in the proper use and maintenance of the equipment.
- Requesting assistance from EH&S in evaluating operations that may present health and safety hazards requiring the use of a respirator.
- Informing EH&S and contacting the Occupational Health Center for medical approval before assigning known or suspected medically restricted employees to jobs requiring the use of respirators.
- Enforcing the use of respiratory protection equipment and other requirements when applicable.

##### **B. Employee Responsibilities**

UCSD employees or persons enrolled in the Respiratory Protection Program for use of respiratory equipment is responsible for:

- Using only those brands and types of respirators for which they have been trained and fitted by EH&S. Only use the respirator for the specific tasks that the respirator was issued to the employees.
- Informing their supervisor of any personal health problems that could be aggravated by the use of respiratory equipment (such as asthma, allergies, or high blood pressure).
- Guarding against damage and ensuring respirators are not disassembled, modified, or otherwise altered in any way other than the changing of respirator cartridges or filters.
- Reporting any observed or suspected malfunctioning respirator to EH&S.
- Bringing used respirators and cartridges to EH&S to be exchanged for a new or cleaned and reconditioned unit.
- Updating their respirator use certification annually by completing the medical history questionnaire, fit testing, and training.

### **C. EH&S Responsibilities**

EH&S is responsible for the following functions:

- Providing a centralized facility for purchasing, maintaining, and evaluating all respiratory equipment needed and used by UCSD employees.
- Providing instruction on the need for respiratory protection; criteria for selecting respirators; and respirator fitting, use, and maintenance
- Issuing respiratory protection equipment; maintaining facilities for the reconditioning and maintenance of equipment; and providing the following additional services:
  - Conducting initial, annual, and other required fit tests for employees who utilize respiratory equipment.
  - Coordinating with the Occupational & Environmental Medicine to obtain findings from Medical History Questionnaire form.
  - Conducting inspections for respiratory equipment usage, maintenance, and storage.
  - Maintaining records of fit test results, training classes, and medical approvals.