



## **Hearing Conservation Program**

### **1.0 Reference**

California Code of Regulations, Title 8, Article 105, Sections 5095 to 5100; and 29 CFR 1910.95.

### **2.0 Policy**

It is the policy of California State University, Fullerton to establish and maintain effective noise control and hearing conservation programs designed to eliminate or control, in so far as is reasonable and practical, overexposure of students, faculty, and staff to harmful noise.

The University shall identify noisy areas on campus and shall take steps to protect personnel who work in these areas. When noise cannot be controlled by engineering and administrative controls, the University shall distribute hearing protectors to all employees exposed to an 8-hour time-weighted average noise level of 85 decibels or greater. Under certain conditions, employees shall be required to use hearing protection.

The University shall provide, at no cost to employees involved in this program, a hearing program designed to provide information of satisfactory maintenance of employee hearing levels and to ascertain the effectiveness of noise control methods.

### **3.0 Purpose**

The purpose of this program is to establish a coordinated approach toward controlling excessive occupational noise exposure as directed by University policy and State law.

### **4.0 Scope**

The Hearing Conservation Program affects all employees exposed to an 8-hour time-weighted average noise level of 85 dBA or greater. The potential for these noise levels have been found in the following departments:

- A. Carpenter Shop
- B. Landscape Services
- C. Central Plant
- D. Publication Services (Reprographics)
- E. Performing Arts wood shop
- F. Building Maintenance
- G. Engineering Shops

- H. Arboretum Grounds Workers
- I. Auto Shop
- J. University Police

All other employees that believe they are working in an environment above 85 dBA TWA should notify EHS.

## 5.0 Control of Noise Exposure

The State of California and Federal Government regulates a worker's exposure to noise. The regulations set exposure limits and details the employer's responsibilities when the limits are exceeded.

The following is a summary of the safety orders regulating exposure of workers to occupational noise. The actual regulations may be found in EHS in T-1475 or on the [Cal/OSHA](#) website.

### 5.1 Hearing Conservation Program

When workers are exposed to an 8-hour time-weighted average [TWA of 85 decibels (dBA)] or greater, the University must institute a hearing conservation program. This program includes monitoring of workplace noise, an audiometric testing program for all exposed workers and an expert evaluation of the test results.

Required audiometric testing must be conducted by a licensed audiologist, otolaryngologist, qualified physician, or trained technician. The results will be made available to employee that was tested. Annual audiograms are compared with the baseline audiogram to determine if there has been any deterioration of the worker's hearing (threshold shift). If a worker suffers a significant threshold shift, the University must fit or refit the worker with hearing protectors, train or retrain the employee in their use and make sure the hearing protection devices are used.

An audiogram is a record of hearing loss of hearing level that is measured at several frequencies—usually 500 to 6000 Hz. The interpretation of the audiogram results are based on the following criteria. Decibel is a measure of sound pressure level or loudness from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

*Sound pressure level measurements are:*

- |                          |  |
|--------------------------|--|
| A. 0 dB level            | The "normal ideal" for the young adult |
| B. 0 to 25 dB level      | Within normal limits of hearing        |
| C. 26 to 40 dB level     | Mild hearing loss                      |
| D. 41 to 70 dB level     | Moderate hearing loss                  |
| E. 71 to 90 dB level     | Severe hearing loss                    |
| F. 91 and above dB level | Profound hearing loss                  |

## **5.2 Hearing Protectors**

Workers must wear hearing protectors when:

- A. They are exposed to a sound level of 85 dBA or greater and have had a standard threshold shift in hearing.
- B. They are exposed to noise in excess of the limits set in Cal/OSHA Title 8, Section 5097.

## **5.3 Training Program**

Workers exposed to noise at or above 85 dBA for 8-hour TWA shall participate in an annual training program. The program will include the effects of noise on hearing, the purpose and effectiveness of hearing protectors, and the purpose of and an explanation of audiometric testing.

## **5.4 Record keeping and Records Access.**

The employer will maintain records of exposure measurements for at least 2 years and audiometric tests for the duration of the affected employee's employment.

These records must be made available to workers, former workers, worker representatives, and authorized representatives of the Division of Occupational Safety and Health.

## **6.0 Responsibilities**

New employees assigned to work in areas listed in Section 4.0 shall be sent to EH&IS for a baseline audiogram within the first two weeks of employment.

### **6.1 EHS**

- A. Coordinate the campus Hearing Conservation Program, providing consultation to departments according to their specific needs.
- B. Conduct personal noise dosimetry to determine time-weighted average (TWA) exposures for individuals and departments.
- C. Conduct noise surveys in response to department requests or as a general noise survey.
- D. Assist departments in developing methods for noise abatement, reduction or control.
- E. Purchase personal protective devices.
- F. Establish and conduct an audiometric testing program for affected employees, providing consultation and notification of exam results.
- G. Maintain and make available records of exposure measurements and audiometric tests.
- H. Maintain training records.

### **6.3 Departments**

- A. Ensure that noise control is considered when procuring equipment, machinery and tools.
- B. Identify work areas that may overexpose employees to harmful levels of noise and notify the EHS Office.
- C. Develop methods for noise abatement, reduction or control.
- D. Train or arrange training for employees covered by the Hearing Conservation Program; ensure that they read, understand and comply with all appropriate procedures.
- E. Ensure that appropriate personal protective equipment is provided to affected employees; enforce the use of such devices when required; ensure that such devices are kept in good repair and maintained in a sanitary manner.
- F. New employees assigned to work in areas listed in Section 4.0 shall be sent to EHS for a baseline audiogram or personal exposure assessments within the first 2 weeks of their assignment.

### **6.4 Employees**

- A. Employees are ultimately responsible for the wearing of hearing protection whenever working in noisy environments.
- B. Read and comply with all appropriate hearing conservation safety procedures while performing assigned duties.
- C. Use common sense and good judgment at all times; the unlimited number of potential hazards that may exist or be created in the work place is sometimes unpredictable.

## **7.0 Sound Levels**

The following relates some common equivalents of sound levels in decibels (dB). Exposure to noise with a loudness of 80 dB is annoying. It is roughly equivalent to the noise level of an alarm clock about two feet from your ear. Exposure to 90 dBA can cause physical damage to the ear. At about 120 dBA, hearing actually becomes painful and damage to hearing is certain and rapid. EHS can provide results of the measured noise level output of CSUF equipment that has been measured or can conduct monitoring for a piece of equipment upon request.

## **8.0 Effects of Overexposure**

8.1 The ear has three sections. The outer ear helps to direct sound into the auditory canal. The middle ear, separated from the outer ear by the eardrum, consists of three connected bones which transmit the vibrations of the eardrum to the inner ear. In the inner ear a coiled hearing organ, the cochlea, transforms the vibrations into nerve impulses for transmission to the brain along the auditory nerve. The cochlea is lined with cells equipped with tiny hairs and is filled with liquid. As the liquid moves in response to the vibrations of the bones of the middle ear, the hairs move sending nerve impulses to the brain for

decoding. The effects of continued overexposure to noise is the destruction of the hair cells and a permanent loss of hearing.

8.2 The first warning of hearing loss is often the inability to hear high frequency sounds. People with hearing deficiencies caused by overexposure to noise lose sensitivity to sound at about 4,000 Hz, the approximate frequency of a bird's song or a voice on the telephone. If the overexposure continues, the range will gradually be extended until the entire hearing is affected. As more and more hair cells of the inner ear are destroyed, the ability to hear is progressively and permanently reduced. Damaged hair cells cannot be repaired or replaced. As a person loses sensitivity to higher frequencies, sounds become distorted. He/she may be able to hear a conversation but unable to understand it. The use of a hearing aid makes the sound louder, but it will not clear the distortion.

8.3 Overexposure to noise affects the entire body. It is associated with tinnitus (ringing in the ears), increased pulse rate, hypertension, increased secretion of certain hormones, tiredness, nervousness, sleeplessness, and other symptoms of stress.

## **9.0 Noise Survey**

9.1 How can you tell there is a noise problem where you work? Common indications of overexposure to noise are temporary hearing loss and muffled speech, ringing in the ears after leaving the work area, or difficulty hearing normal speech in the work area.

9.2 If you suspect that there is a noise problem, the next step is to request a noise survey. The purpose of the survey is to measure the noise levels workers are exposed to, find the source of the noise, and determine corrective measures. If a noise survey is needed, the affected employee should inform his/her supervisor who will in turn request this service from the EHS Office.

## **10.0 Controlling Noise**

If the noise survey reveals an overexposure problem, the following are alternative ways to reduce the exposure to within acceptable limits.

10.1 **Engineering Controls.** Noise levels can be controlled by making changes in the machinery, the way the machinery operates, or the design of the structure in which the machinery is housed. Engineering controls include barriers, damping, isolation, muffling, noise absorption, mechanical isolation, variations in force, pressure or driving speed, combinations of these and other means of reducing noise emissions. The way that these solutions are applied depends on the particular source of the noise and the characteristics of the noise being produced. The practical application of noise controls requires the services of an experienced and innovative engineer.

10.2 **Administrative Controls.** These may also be referred to as operational controls. These controls limit the length of time workers are exposed to noise in the work area. This involves assigning the worker to less noisy areas in the workplace so that the average of his/her daily

exposure is less than the permissible exposure limit. The choice of which kind of controls to use is governed by the particular noise control problem being encountered.

10.3 Personal Protective Equipment. When engineering and/or administrative controls either fail to reduce noise to within required limits or are not technologically feasible, hearing protectors must be used.

When either earmuffs or ear plugs are used, sufficient variety should be available to insure that workers can get a good fit. Protective devices should be both effective and comfortable. Sized ear plugs are made of soft, flexible materials which will conform to the shape of the wearer's ear canal. Other plugs are malleable, made of cotton, paper, plastic, and other materials. They can be thrown away after each use and are designed to fill all ears.

When ear muffs are used, make sure that the seal between the muff and the head is tight. Long hair, glasses, and other obstructions may diminish the effectiveness of the device.