

# **11. Hearing Conservation Program**

## **Chapter 296-817, WAC**

### **1.0 Introduction**

This hearing conservation program applies to those employees who are exposed to noise levels that equal or exceed an 8-hour time-weighted average (TWA) sound level of 85 decibels (dB). Noise exposures should be computed in accordance with WAC 296-817-300; Table 1, without regard to the fact that personal protective equipment may reduce employee noise exposure.

The following examples are typical of high noise level environments:

- Grounds maintenance equipment
- Machine shops
- Print shops
- Compressed air environments
- Boiler rooms
- Dish rooms

### **2.0 Responsibilities**

#### **2.1 Supervisors**

- Notify employees if they have an exposure to noise at or above 85 dBA.
- Arrange for training of affected employees
- Assist Environmental Health & Safety Manager in arranging audiometric testing.
- Assist in follow up (see below) procedures when audiometric testing identifies a standard threshold shift
- Enforce the use of hearing protection

#### **2.2 Environmental Health & Safety Manager**

- Arrange for annual audiometric testing
- Assist supervisors in obtaining noise level measurements of the environment.
- Work with employees on follow up procedures when a standard threshold shift is identified.
- Assist in evaluating the appropriate hearing protection for the environment.

### **3.0 Monitoring Requirements**

When reasonable information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 dBA, Pacific Lutheran University must obtain individual or representative exposure measurements for the employees who may be exposed at or above that level. If you suspect that your work environment exceeds 85 dBA, please contact the Environmental Health & Safety Manager for assistance in obtaining exposure measurements.

Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise exist, we will use representative personal sampling unless area sampling will produce the same results.

### **3.1 Repeating Monitoring of Environments**

Monitoring must be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

- Additional employees may be exposed at or above an 8-hour time-weighted average of 85 dBA.
- Employees are exposed to higher level of noise requiring more effective hearing protection.

### **3.2 Employee Notification**

The supervisor or the Environmental Health & Safety Manager will notify each affected employee when the results of the monitoring show that they are being exposed to an 8-hour time-weighted average of 85 dBA or greater.

### **3.3 Observation of Monitoring**

The university will provide effected employees or their representatives with an opportunity to observe any measurements of employee noise exposure.

## **4.0 Audiometric Testing Program**

All employees whose exposures equal or exceed an 8-hour time-weighted average (TWA) of 85 dBA will be tested annually. The program will be provided at no cost to employees and may utilize an outside source to perform the actual tests.

Audiometric tests will be performed by a licensed or certified audiologist, otolaryngologist, or other qualified physician, or by a technician who is certified by the council of accreditation in occupational hearing conservation.

### **4.1 Baseline Audiogram**

The first test establishes a valid baseline audiogram for each effected employee. The baseline audiogram will be used to compare subsequent audiograms.

Testing to establish a baseline audiogram will be preceded by at least 14 hours without exposure to workplace noise. This may be accomplished by use of hearing protectors. However, the supervisor must notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.

### **4.2 Annual Retesting**

New audiograms will need to be obtained annually for each affected employee. Annual audiometric testing may be conducted at any time during the work shift. Employees must avoid noise for 14 hours preceding the test.

### **4.3 Evaluation of Audiogram**

Annual audiograms will be compared to each employee's baseline audiogram to determine if a standard threshold shift has occurred. A certified audiometric technician will make this comparison.

If the annual audiogram indicates that an employee has suffered a standard threshold shift, the university may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.

An audiologist, otolaryngologist or other qualified physician will review audiograms that indicate a standard threshold shift to determine whether there is need for further evaluation.

Each employee will be informed of the results of his/her audiometric test and whether or not there has been a hearing level decrease or improvement since his/her previous test.

#### **4.4 Follow-up Procedures**

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift, the Environmental Health & Safety Manager and the supervisor will ensure that the following steps are taken:

- Employees not using hearing protectors are to be fitted with hearing protectors, trained in their use and care, and required to use them.
- Employees already using hearing protectors must be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
- Inform the employee in writing, within 21 days of the determination, of the existence of a standard threshold shift.
- Refer the employee for a clinical audiological evaluation or an otological examination if additional testing is necessary or if the employer suspects that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors. There will be no cost to the employee.
- Inform the employee of the need for an otological examination when a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.

#### **4.5 Revised Baseline**

An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist, otolaryngologist or other qualified physician who is evaluating the audiogram:

- The standard threshold shift revealed by the audiogram is persistent.
- The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

#### **4.6 Audiometric Test Requirements**

Those conducting all audiometric tests must assure the university that the tests meet the requirements of WAC 296-817-400.

### **5.0 Noise Control**

Engineering, Administrative and Personal Protective Equipment controls have been and will continue to be explored for those employees whose exposures equal or exceed an 8-hour time-weighted average of 85 dBA. Suggestions to the Environmental Health & Safety Manager are welcome.

### **6.0 Hearing Protectors**

The university will supply and replace hearing protectors for all employees exposed to a time-weighted average of 85 dBA or greater.

Supervisors will ensure that hearing protectors are worn:

- By any employee who is exposed to an 8-hour time-weighted average of 85 dBA or greater.

- By any employee who is exposed to noise above 115 dBA.
- By any employee who is exposed to any impulsive or impact noise measured at or above 140 dB peak using an impulse sound level meter set to either the linear or C-scale.

Employees may select their hearing protectors from at least two different types (i.e. molded, self-molded, custom molded, or ear muffs) of suitable hearing protectors provided by the university.

The supervisor must provide training in the use and care of all hearing protectors provided to employees. The supervisor must also ensure proper initial fitting and supervise the correct use of all hearing protectors. Contact the Environmental Health & Safety Manager for assistance.

### **6.1 Hearing Protection Evaluation (using the NRR)**

The supervisor must evaluate hearing protector effectiveness for the specific noise environments in which the protector will be used. The most convenient method to use is the Noise Reduction Rating (NRR) that is listed on the hearing protector package. One common method of using the NRR to determine whether a particular hearing protector provides adequate protection within a given exposure environment, is the following:

- Obtain the employee's A-weighted time weighted average (TWA) or noise level exposure.
- Subtract 7 dB from the NRR of the hearing protection device.
- Subtract the remainder from the A-weighted TWA (above) to obtain the estimated A-weighted TWA under the ear protector.

Hearing protectors must lower employee exposure to less than 85 dBA.

The adequacy of hearing protector attenuation must be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. The supervisor will provide more effective hearing protectors where necessary.

### **7.0 Training Program**

All employees who are exposed to noise at or above an 8-hour TWA of 85 dBA will receive training at the time of the annual hearing test. In most cases, the person who performs audiometric tests will also provide the required training. Supervisors of employees who must obtain a hearing test outside of the scheduled group hearing test program may need to provide training themselves. The Environmental Health & Safety Manager may assist with arranging training.

Each employee will be informed of the following:

- The effects of noise on hearing;
- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care.
- The purpose of audiometric testing, and an explanation of the test procedures.
- The right to access their records.

### **8.0 Access to Information**

A copy of the Hearing Protection Standard and university program is available and can be obtained from the Environmental Health & Safety Manager, safety website, or your supervisor.

## 9.0 Warning Signs

Signs must be posted at entrances to or on the periphery of all well-defined work areas in which employees may be exposed at or above 115 dBA. Warning signs must clearly indicate that the area is a high noise area and that hearing protectors are required.

## 10.0 Recordkeeping

### 10.1 Exposure Measurements

The university will maintain an accurate record of all employee exposure measurements required by this section.

### 10.2 Audiometric Tests

The Environmental Health & Safety office will retain a legible copy of all employee audiograms. This record will include:

- Name and job classification of the employee.
- Date of the audiogram.
- The examiner's name.
- Date of the last acoustic or exhaustive calibration of the audiometer.
- Employee's most recent noise exposure assessment.

### 10.3 Record Retention

The university will retain records required in this section for at least the following periods:

- Noise exposure measurement records shall be retained for two years.
- Audiometric test records shall be retained for the duration of the affected employee's employment.

### 10.4 Access to Records

All records required by this section shall be provided upon request to employees, former employees, representatives designated by the individual employee, and the director. The provisions of WAC 296-62-052 apply to access to records under this section.

## 11.0 Definitions

**Impulsive or Impact Noise:** Noise levels that involve maxima at intervals greater than one second. Where the intervals are less than one second, the noise levels shall be considered continuous.

**Noise dose:** The ratio, expressed as a percentage, of (a) the time integral, over a stated time or event, of the 0.6 power of the measured SLOW exponential time-averaged, squared A-weighted sound pressure and (b) the product of the criterion duration (8 hours) and the 0.6 power of the squared sound pressure corresponding to the criterion sound level (90 dB).

**Standard threshold shift:** A hearing level change, relative to the baseline audiogram, of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

**Time-weighted average sound level:** That sound level, which if constant over an 8-hour period, would result in the same noise dose as if measured in the time varying noise level environment.