

# HEARING CONSERVATION PROGRAM

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## Purpose

The purpose of this program is to protect employees from hearing loss caused by occupational exposure to hazardous noise. The program details the responsibilities of various groups and includes noise reduction methods, requirements for noise exposure surveys, audiometric testing, the selection and use of hearing protection, training, and recordkeeping.

## Scope

This program applies to all Temple University employees whose noise exposure levels equal or exceed an 8-hour time-weighted average (TWA) noise level of 85 dBA.

## Definitions

- **Action Level (AL):** 85 A-weighted decibels (dBA) averaged over an eight-hour period or a 50 percent dose. This is the exposure at which an employee must be enrolled in the Hearing Conservation Program.
- **Audiometric Testing:** Exams that measure the sensitivity of a person's hearing threshold in decibels. The testing also establishes a baseline hearing threshold that is compared to later exams to determine if hearing loss has occurred.
- **A-Weighted Decibel (dBA):** An expression of the relative loudness of sounds in air as perceived by the human ear.
- **Decibel (dB):** A unit used to measure the intensity of sound. In the measurement of sound intensity, decibel increases effect sound intensity exponentially.
- **Hearing Protection Device (HPD):** A device worn to reduce the level of sound that enters an employee's ear.
- **Hertz (Hz):** A unit used to measure frequency. In the measurement of sound, frequency determines the pitch of a sound.
- **Noise Induced Hearing Loss (NIHL):** Permanent hearing impairment resulting from prolonged exposure to high levels of noise.
- **Noise Reduction Rating (NRR):** A guideline that indicates the average amount of potential protection a hearing protection device will give in the presence of noise. It is a laboratory derived value that hearing protection device manufacturers place on their products, as a guide to gauge effectiveness of the device. Actual sound attenuation is much lower than the NRR depicts.

- **Permissible Exposure Limit (PEL)**: The maximum concentration of a specific substance that an employee can be exposed to over an 8-hour shift, without suffering adverse health effects.
- **Sound Attenuation**: A reduction in the intensity of sound.
- **Standard Threshold Shift (STS)**: A change in an employee's hearing threshold, relative to the results of baseline audiometric testing, of an average of 10 decibels or more at 2000, 3000, and 4000 hertz in one or both ears.
- **Time-Weighted Average (TWA)**: A method used to calculate an employee's daily exposure to a hazardous substance, averaged over an 8-hour workday.

## **Responsibilities**

### **Environmental Health & Radiation Safety (EHRS)**

- Ensures implementation and compliance with this program.
- Assists in the assessment of work practices and workplaces to determine how hazardous noise exposures can be eliminated, prevented, and controlled.
- Conducts appropriate noise exposure evaluations to identify employees who are required to participate in the Hearing Conservation Program.
- Provides additional evaluation whenever changes are made that may affect noise levels.
- Maintains a database of noise monitoring results.
- Provides noise monitoring results to the employee and Employee Health Services to be included in the employee's medical file.
- Conducts baseline, annual, and post-employment audiometric testing.
- Provides results of audiometric testing to Employee Health Services.
- Notifies affected employees of required audiometric testing.
- Assists in the selection and approval of hearing protection devices and advice on their proper care and use.
- Provides required initial and refresher training for employees in the Hearing Conservation Program and maintains training records.

### **Employee Health Services**

- Communicates audiometric testing results, work restrictions, and any identified standard threshold shifts to the affected employee.
- Communicates work restrictions to EHRS and the affected employee's supervisor.
- Maintains results of audiometric testing in the employee's medical file.
- Establishes any work restrictions necessary to prevent additional hearing loss.

### **Supervisors**

- Complies with the requirements outlined in this program.
- Requests a noise exposure evaluation from EHRS where high noise exposures are suspected or anticipated.
- Ensures employees wear hearing protection in high noise areas.
- Ensures employees receive training and audiometric testing as needed.
- Purchases and installs warning signs in high noise areas.

### **Employees**

- Receives audiometric testing when requested.
- Wears appropriate hearing protection when needed at work and minimizes noise exposure outside of work.
- Maintains hearing protection in sanitary condition and proper working order.
- Reports noise hazards and hearing protection problems to the appropriate supervisor or EHRS.
- Attends Hearing Conservation training offered by the EHRS.

## **Program Requirements**

### **Noise Reduction and Controls**

Excessive noise shall be reduced or eliminated whenever possible. This shall include the implementation of engineering and/or administrative controls, when feasible. When engineering and administrative controls are not feasible, or during the evaluation and implementation of such controls, hearing protective equipment shall be used to protect employees as needed from excessive noise exposure.

### **Engineering Controls**

Engineering controls are used to control the hazard at its source and should be implemented prior to using administrative controls whenever possible. The basic concept behind engineering controls is that, to the extent feasible, the work environment and the job itself should be designed to eliminate hazards or reduce exposure to hazards. These may include:

- Quieter machinery.
- Quieter processes.
- Reduction of noise transmission.
- Isolation of equipment or equipment operator.
- Proper maintenance of machinery and equipment.
- Purchasing procedures that specify criteria for maximum noise levels.

### **Administrative Controls**

Administrative controls do not reduce or eliminate the hazard; they simply reduce employee exposure to the hazard. Administrative controls may include:

- Rotation of employees to limit individual exposure times.
- Flexible machinery operation schedules to limit exposures.
- Work task arrangements that reduce the time an employee must spend in a noisy area.

### **Nuisance Noise**

In some cases, noise does not exceed standards established to protect hearing, but does interfere with speech or can be an annoyance. For example, nuisance noise can prevent effective communication between two or more employees working together as well as irritate employees, thereby reducing productivity. Although there are no regulatory standards for nuisance noise in the occupational setting, the controls outlined in this program should be followed to protect employees from exposure to this type of noise.

### **Noise Exposure Evaluation**

EHRS will identify high noise areas through routine audits, at the request of Supervisors, and in response to employee concerns.

- Exposure monitoring, if warranted, will be performed by EHRS when information indicates that employee exposure is at or above an 8-hour time-weighted average of 85 dBA.
- The sampling strategy shall be designed to identify employee for inclusion in the Hearing Conservation Program and to enable the proper selection of hearing protection devices.
- All continuous, intermittent, and impulsive sound levels from 80 to 130 decibels shall be integrated into the computation of an 8-hour time weighted average.
- Noise monitoring shall be conducted in accordance with OSHA requirements. Monitoring shall be repeated whenever a change in production, process, equipment, or control increases noise exposure such that additional employees may be exposed at or above the Action Level or the attenuation provided by the hearing protectors being used is no longer adequate.
- Results of employee noise exposure monitoring shall be communicated to employee, whether such result is below, at, or above the Action Level.

### **Audiometric Testing**

The audiometric testing is an essential element of the hearing conservation program. It compares the baseline results to the results of successive annual audiometric testing. Thus, it helps to determine the effectiveness of the Hearing Conservation Program or whether a noise induced hearing loss (NIHL) has occurred.

- The audiometric testing shall be performed on these occasions:
  - Pre-placement, or where not feasible within 6 months of an employee's first exposure at or above the Action Level to establish a baseline.

- Annually as long as the employee exposure is at or above the Action Level.
  - At the termination of employment.
- Audiometric testing will be arranged by EHRS for all employees whose exposures equal or exceed the Action Level. Audiometric testing shall be provided at no cost to employees.
- The baseline testing must be preceded by at least 14 hours without exposure to workplace noise. Hearing protection devices may be worn during this time as a substitute for this requirement.
- Each employee's annual audiometric testing results shall be compared to the initial baseline results to determine if a standard threshold shift (STS) has occurred or whether there is a need for further evaluation.
- If an STS is detected, the employee should undergo another audiometric testing within 30 days of the first test to confirm the threshold shift.
- Employee Health Services shall inform employee of audiometric testing results within 21 days of testing if there is indication of a work-related STS.

### **Selection and Use of Hearing Protection**

Where required, departments shall provide hearing protection to employees at no cost. Hearing equipment shall be immediately replaced by the department when broken, defective, or unsanitary. EHRS can help determine appropriate types of hearing protection for specific situations and provide training on its proper use and care.

- The use of hearing protection is required:
  - For all personnel exposed above the Action Level.
  - During operations or in areas where the ambient noise levels meet or exceed 90 dBA.
  - For all individual who have experienced a standard threshold shift.
- Hearing protection shall exceed the minimum noise attenuation rating required to ensure the employee's noise exposure is below the permissible exposure limit.
- For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposures to an 8-hour time-weighted average of 85 decibels or below.
- Employees shall be given the opportunity to provide input in the selection process.
- When selecting hearing protection, the following method will be used to estimate the adequacy of hearing protection attenuation:
  - Obtain the employee's A-weighted TWA.
  - Subtract 7 dB from the noise reduction rating (NRR) and subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.
- It is the responsibility of Supervisors to ensure that employees wear appropriate hearing protection when required.

## Signage

In all locations where noise levels are expected to exceed 90 dBA due to the operation of noisy equipment or machinery, signage must be installed to warn people that they must wear hearing protection when the noisy equipment is in use. The Supervisor is responsible for purchasing and installing signage. EHRS can assist in the selection of appropriate signage.

## Training

Hearing conservation training is required for all employees who are enrolled in this program and shall be repeated at least annually. Training is provided by EHRS. Both the employee's department and EHRS shall maintain training records (see below for specific record keeping requirements). Training topics shall include 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.
- Areas where hearing protection must be worn.
- Requirements of Temple University's Hearing Conservation Program.

## Recordkeeping

- Exposure Monitoring
  - Noise exposure measurement records are maintained by EHRS and are retained for the duration of the person's employment at Temple University.
- Audiometric Testing
  - Audiometric test results are maintained by Employee Health Services and are retained for the duration of the person's employment at Temple University.
  - Employees have the right to review records of their noise exposure data and audiometric tests.
- Training
  - Training records are maintained by EHRS and are retained for the duration of the person's employment at Temple University.