

# **P-3**

# **Hearing Conservation**

## I. Policy

This operating procedure provides the minimum steps required for all affected Divisions or Bureaus to ensure that the Department of General Services' Hearing Conservation Program is successfully and consistently implemented.

This procedure is designed to protect the General Services personnel who perform work in areas where noise levels may exceed 85 decibels; A-weighted scale (dBA) over an 8 hour time-weighted average (TWA) in the completion of their job duties.

The OSHA standard 29 CFR 1910.95 provides the guidelines for the General Services Hearing Conservation Program.

Employees who are exposed to noise levels exceeding 85 dBA on an 8-hour time-weighted average (TWA) basis shall be included in the General Services Hearing Conservation Program. Aspects of the program include:

- Evaluation of noise exposures to employees.
- Initial and periodic training.
- Provision of hearing protection devices.
- Annual audiometric testing.

If employees are exposed over 90 dBA averaged over an 8-hour period, the following aspects of the Hearing Conservation Program also apply:

- The Safety Coordinator or Consultant shall assess whether noise exposures can be reduced below 90 dBA TWA using engineering controls.
- Hearing protection is **mandatory** if noise levels can not be reduced below 90 dBA.

## II. Responsibilities

- A. Supervisors and Bureau Directors should evaluate their work areas and operations to determine if existing work (equipment, tools, etc.) appears to be generating excessive noise levels or if planned work may be expected to do so. If they are uncertain about exposure levels, they should contact the Safety Coordinator to discuss conducting a noise exposure assessment. When noise exposure hazards are identified, they should be eliminated or controlled to ensure employees are provided a workplace free of these hazards or where adequate controls are provided.
- B. Supervisors should ensure their personnel are familiar with this procedure, adhere to its guidelines, and are provided necessary hearing protection devices as necessary.
- C. The Safety Coordinator is responsible for evaluating the administration of this procedure. The Safety and Health Consultant is available to provide technical guidance, noise dosimetry and training.

### **III. Definitions**

**Sound**: Rapid pressure variations which travel through an elastic medium (air) that are picked up by a receiver (the ear).

**Noise**: Unwanted sound (unwanted because of its interference with communication, irritation, annoyance, and possible loss of hearing).

**Continuous Noise**: A noise in which the noise remains essentially constant for a prolonged period of time.

**“A Weighting”**: An electrical network incorporated into a sound level meter that is designed to approximate the hearing response of the human ear.

**Decibel**: A non-dimensional unit used to express sound levels on a logarithmic scale.

**Attenuate**: To reduce the intensity.

**Temporary Threshold Shift**: Temporary loss of hearing that is recoverable after a period of time. Typical frequencies at which the temporary threshold shift occurs are 4000 to 6000 hertz.

**Standard Threshold Shift**: A change relative to a baseline of 10 dB or more in the average hearing level at 2000, 3000, and 4000 hertz in either ear.

**Presbycusis**: Hearing loss related to aging.

**Conductive Hearing Loss**: Hearing loss not associated with physical damage to the inner ear, but is due to the interference with normal transmission of vibration to the inner ear.

**Sensor-Neural Hearing Loss**: Hearing loss associated with poor transmission of sounds by the nerve pathways to the brain due to damage to the nerves.

**Noise Induced Hearing Loss**: A cumulative, permanent loss of hearing in the inner ear, which develops over a period of long noise exposure. Noise induced hearing loss usually affects both ears equally.

**Audiogram**: A chart or table showing hearing level (ability) as a function of the sound frequency and left or right ear.

**Audiologist**: A person trained in specialized problems of hearing and deafness.

**Audiometer**: An instrument that measures a person’s hearing ability.

**Hair Cells** - Sensory receptors for sound stimuli located in the cochlea (inner ear).

**Tinnitus**: A subjective sense of noises in the head such as ringing, humming, or buzzing in the ears for which there is no observable external cause.

**Hearing Conservation:** A five-part program, which involves exposure evaluation, audiometric testing of employees, use of hearing protection, employee training, and recordkeeping.

**Action Level:** 85 dBA over an 8-hour TWA, the exposure level at or above which employees must be included in a hearing conservation program.

#### **IV. Noise Exposure Evaluations**

Noise exposure evaluations should be conducted by an Industrial Hygienist to determine if high noise work tasks are performed by General Services' employees. An appraisal of each exposure should be made to determine the most effective prevention and control strategies and whether employees should be included in a Hearing Conservation Program. The following criteria and methods should be considered:

- When information indicates that any employee's exposure may equal or exceed an 8-hour TWA of 85 dBA, operations in that area should be evaluated with noise level measurements and preferably personal noise dosimetry.
- The sampling strategy must be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.
- Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise makes area noise monitoring generally inappropriate, the analyst must use representative personal dosimetry.
- All continuous, intermittent, and impulsive sound levels from 80 dBA to 130 dBA must be integrated into the noise measurements.
- Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.
- Monitoring must be repeated whenever a change in equipment or controls increases noise to the extent 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.

#### **V. Noise Control Approaches**

Control strategies should be selected based on the following priority system:

1. Eliminate noise exposure through process (including engineering) controls.
2. Provide and assure the proper use of hearing protection devices.
3. Administratively protect people.

The following minimal controls should be implemented when noise exposures are identified. Where exposures to noise are at or above 90 dBA over an 8 hour TWA, the following methods to control noise should be considered:

- Engineering methods, i.e., physical changes that reduce the noise that is generated.
- Administrative methods, i.e., changes in scheduling or employee rotation that result in reducing the workers exposure by limiting exposure time.
- Personal protective equipment such as earplugs and ear muffs.

If noise can be brought below 85 dBA over an 8 hour TWA, through either sole use or a combination of engineering and administrative controls, then a hearing conservation program is not required.

Ideally, removing or reducing noise by engineering controls would be the best approach to control employees' exposures to noise and reduce the possibility of a noise induced hearing loss (NIHL).

**Hearing protection** is the most common method for reducing noise exposure to employees. A hearing protection device (HPD) is a device that can be worn to reduce the level of sound entering the ear. They fall into two general categories: Earmuffs and inserts. There are several types of each.

Since each employee is different, they will react differently to the variety of HPDs available. It is required that a variety (i.e., at least two) different types of devices be made available.

**Fitting** is a critical component of hearing protection use. If hearing protectors are not properly fitted, they are not as effective. The following guidelines apply:

- Each employee must learn the correct way to fit the hearing protectors they chose.
- The manufacturer's instructions for the specific hearing protectors should be read and followed.
- The audiologist or other individual administering the audiometric test should be able to provide instruction to the employer on proper fit.

As with any protective device, hearing protectors must be cared for and maintained. Reusable muffs and inserts require regular inspection, cleaning, sanitation, and proper storage.

It is important to note that the selected hearing protection must have the capability to attenuate noise at the ear to an 8 hour TWA of 90 dBA or to 85 dBA or below for employees who have experienced a standard threshold shift. The noise reduction rating (NRR) is a manufacturer's rating that is used to compare hearing protectors regarding their ability to attenuate noise. Actual noise reduction may be less than the NRR.

## **VI. Audiometric (Hearing) Testing**

- A. Audiometric testing is critical to the success of hearing conservation programs. It is the only way to determine whether noise induced hearing loss has occurred and/or is being prevented by the hearing conservation program. This is done by comparison of baseline audiograms to annual audiograms. All employees who are exposed over 85 dBA averaged over an eight hour TWA must be provided with audiometric testing before the initial assignment in the area and annually thereafter.
- B. When a comparison of audiograms shows a standard threshold shift, temporary threshold shift, early permanent threshold shift, or progressive noise induced hearing loss has occurred, it is essential to take quick action to halt the loss before additional deterioration occurs. Because noise induced hearing loss occurs gradually, it is not typically accompanied by pain or other warning signs. The affected employee will not notice the change until a large standard threshold shift has occurred.
- C. Audiograms should be performed on the following five occasions:
- Pre-placement, or if not possible;
  - Within 6 months of an employee's first exposure at or above the action level;
  - Annually for as long as the employee is exposed to noise levels at or above the action level;
  - At the time of reassignment out of the area where employees are exposed to noise levels at or above the action level and/or
  - At the time of termination of employment.
- D. Audiometric tests must be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council for Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining, and checking calibration and proper functioning of the audiometer being used. A technician who operates microprocessor audiometers does not need to be certified. A technician must be responsible to an audiologist, otolaryngologist, or physician.

## **VII. Training**

- A. Departments must provide education for all personnel who might be exposed to noise levels exceeding 85 dBA on an eight-hour TWA basis. The program must enable personnel to recognize the hazards and provide guidance in methods to minimize exposure to those hazards. The program shall ensure that each employee is informed of the following:
1. The effects of noise on hearing;

2. The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and
  3. The purpose of audiometric testing, and an explanation of the test procedures.
- B. Circumstances where additional training is required include, but are not limited to:
1. Changes in the workplace that render previous education inadequate; and
  2. Changes in regulations or health data that introduces new information that must be presented.
  3. Training is usually updated on an annual basis.

### **VIII. Program Review and Continuous Improvement**

- A. The Safety Coordinator will evaluate the Hearing Conservation Program at least annually to ensure their effectiveness. The evaluation will be performed to ensure that the procedures are current and practical, and that the regulatory requirements are being implemented
- B. Modifications will be implemented and incorporated into the procedures within one month. When revisions are made to the procedures, General Services employees will be furnished with information regarding modifications.

### **IX. Record keeping**

#### **A. Hazard Evaluations**

Hazard evaluations should be recorded and maintained in applicable department files.

#### **B. Training**

Each Bureau and the Safety Coordinator must maintain records of Hearing Conservation Training. The following minimum data must be recorded:

1. Name(s) of employee(s);
2. Date of training;
3. Proficiency results;
4. Instructor; and
5. Training summary.

#### **C. Procedure Review**

Records of annual procedure reviews must be kept by Safety Coordinator.

#### **D. Audiometric Testing**

Records of audiometric testing shall be maintained in the employee's confidential personnel file.

## **Appendix A: Site Wide Evaluation**

### **Required Hearing Protection (Points Reaching 90 DBA and above)**

1. Central Plant
2. Finance Elevator Motor Room
3. Irvis Building Mechanical/Fan Rooms (Basement)
4. Finance (1<sup>st</sup> Floor) Fan Room D

### **Provided Hearing Protection (Points Reaching 85 DBA)**

1. North Office Building (Basement) B26 – Mechanical Space – During Operation
2. Rachel Carson (Penthouse) Elevator Motor Room – During Operation
3. Rachel Carson (4<sup>th</sup> Floor) Mechanical Areas- During operation
4. Rachel Carson (1<sup>st</sup> Floor) Room 125 – During Operation
5. Ryan Building (Basement) Generator Room – During Operation

## Appendix B: Industrial Noise Level Chart

