UNIVERSITY OF TEXAS ARLINGTON | ENVIRONMENTAL HEALTH & SAFETY

Hearing Conservation

THE UNIVERSITY OF TEXAS AT ARLINGTON

Hearing Conservation Manual

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I. Introduction

Employee hearing protection at The University of Texas at Arlington (UT Arlington) is considered an important objective in overall worker health. In an effort to maintain effective hearing protection for employees at the university, the Hearing Conservation Program has been established. The primary objective of the Hearing Conservation Program is to eliminate employee hearing loss as a result of job-related noise exposure. This program includes the following requirements for those employees exposed to a time-weighted average (TWA) "action level" of 85 dBA (decibels measured on the A scale of a sound level meter):

- An ongoing program of monitoring, identification and evaluation of noise hazards
- Annual hearing test (audiogram) of employees
- Employee training concerning the effects of noise on hearing and proper use and care of hearing protection devices
- Appropriate follow-up procedures for those individuals who have experienced a standard threshold shift (STS)

Employees participating in the Hearing Conservation Program will be required to wear hearing protection devices, as needed, to reduce noise exposure levels below 90 dBA TWA. Employees who have experienced an STS will have noise exposure levels attenuated below 85 dBA TWA.

II. Standard Overview

The Occupational Safety and Health Administration (OSHA) Standard 1910.95 addresses occupational noise exposure. Within the standard are two allowable noise exposure levels measured in decibels (dB). An action level (AL) is 85 dB and a permissible noise level is 90 dB. These noise levels are each the TWA of an employee's exposure throughout an eight-hour work shift. Noise levels from 80 dB to 130 dB are measured in calculating a TWA. If a TWA is above 85 dB, inclusion into the UT Arlington Hearing Conservation Program is required. Hearing protection is required if the TWA noise level exceeds 90 dB. Hearing protection devices (HPDs) must attenuate or reduce an employee's noise exposure <90 dBA TWA. Changes in a noise exposure time or noise producing equipment may require additional noise evaluation.

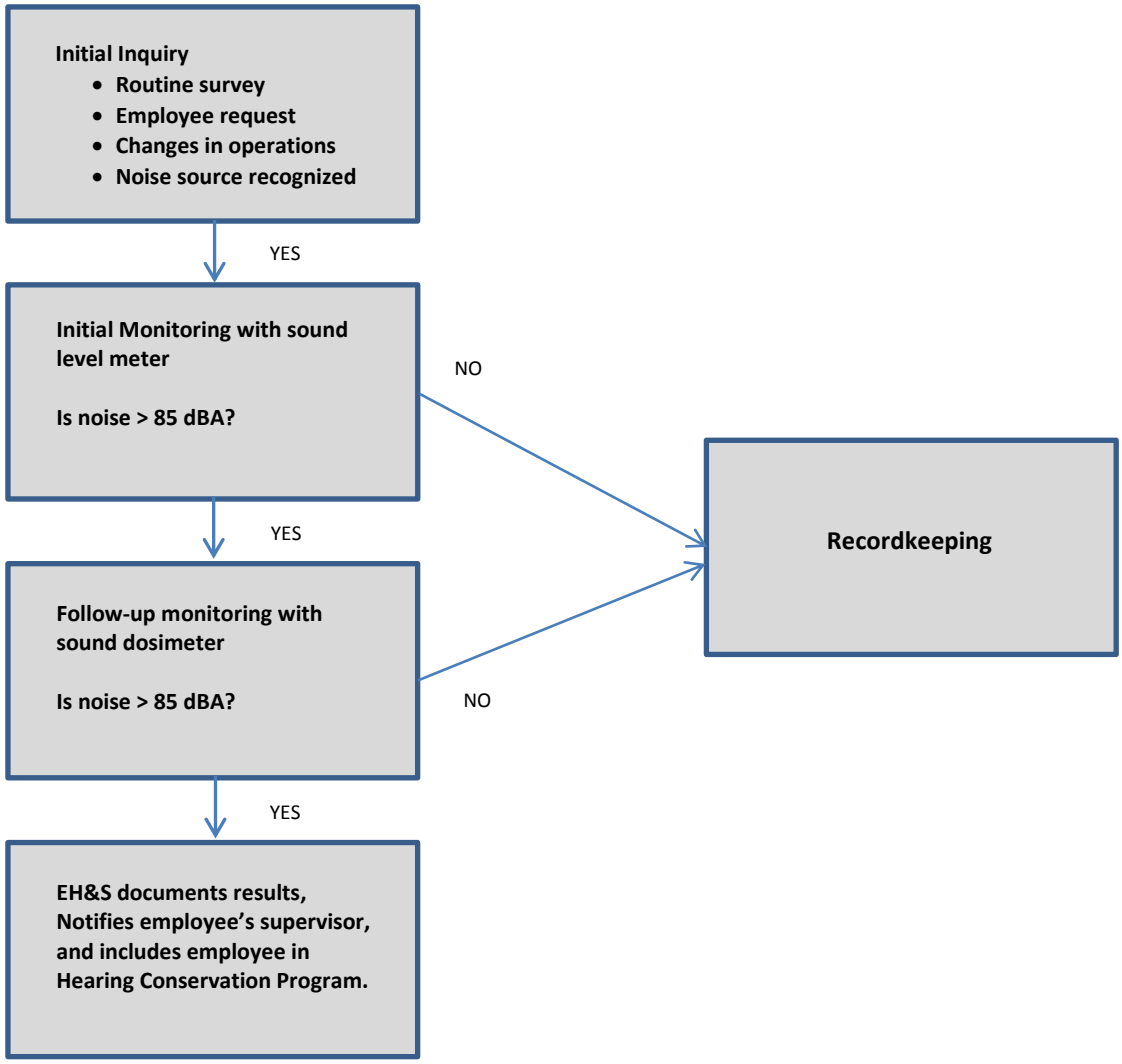
Another aspect of the UT Arlington Hearing Conservation Program is audiometric testing. This program is available at no cost to all employees with noise exposure ≥85 dBA TWA. A baseline audiogram must be taken within six months after the employee is exposed to noise levels ≥85 dBA TWA. An employee must be aware that high noise levels (≥ 85 TWA) must be avoided 12 hours prior to examination (HPDs may be used). An annual audiogram is required for all employees in the program. The annual audiogram will be compared to the employee's baseline audiogram, to determine if an STS has occurred. Hearing testing is performed by a licensed professional or certified technician (certified by the Council of Accreditation in Occupational Hearing Conservation).

An STS is a reduction in several frequencies of the many that an ear can hear. If an STS is diagnosed, an employee will be notified within 21 days and notified within 30 days if a retest is necessary. Employees with an STS must be refitted and trained again on the use of hearing protection. For employees with an STS, noise attenuation with an HPD must be <85 dBA TWA.

A training program is mandatory for all employees exposed to noise ≥ 85 dBA TWA. Training shall be repeated annually and includes the effects of noise on hearing and the correct use and purpose of hearing protection (advantages, disadvantages, types, selection, fitting, use, and care). Also included in the training shall be information on the purpose of audiometric testing and an explanation of the test procedures.

Record keeping is also a requirement of the standard. Files must be kept on exposure measurements and audiometric tests. Noise exposure records must be retained for two years. Audiometric test records are retained for the duration of an affected employee's employment.

Decision Tree for Determining Participation in the Hearing Conservation Program



III. Program Elements

The program elements of the Hearing Conservation Program include exposure monitoring, medical surveillance, employee training, and recordkeeping. Specific details about each program element follows.

A. Exposure Monitoring

Monitoring employee exposure to potential noise hazards will be conducted by EH&S. Employee noise exposure monitoring will be initiated:

- Through routine noise hazard surveys (i.e., general surveys, inquiries, etc.)
- When a change in an activity or process occurs that potentially increases the noise hazard to a level of 85 dBA or above (i.e., supervisor initiated).

If a potential noise hazard is identified in the initial exposure monitoring using a sound level meter, a more detailed investigation may follow, using a sound dosimeter to determine whether an employee should be included in the hearing conservation program. A noise dosimeter will monitor an employee's noise exposure for an entire shift. All employees who are exposed to an action level of 85 dBA TWA or higher will be notified of the noise hazard by EH&S and included in the Hearing Conservation Program.

Noise exposure limits, as specified by the Occupational Safety and Health Administration (OSHA), are shown in Table 1. The table shows the maximum time period allowable for the noise exposure level listed. The acceptable sound level (limit) is a TWA value.

OSHA Noise Exposure Limits

Time (Hours)	Acceptable Sound Level (dBA) (Time Weighted Average)
16.00	85
8.00	90
4.00	95
2.00	100
1.00	105
0.50	110
0.25 or less	115

B. Medical Surveillance

Audiometric tests will be performed by a physician, an audiologist, or an occupational hearing conservationist certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) or the equivalent, working under the supervision of an audiologist or physician. A baseline audiogram will be provided within six months of initial employment, for all employees with noise exposures greater or equal to 85 dBA TWA. In addition, an annual audiogram will be performed thereafter.

An audiogram is evaluated to determine if an employee has an STS. An STS is the reduction in hearing at several frequencies. An employee must be notified of an STS within 21 days and must be re-tested within 30 days.

C. Training

Specific issues will be addressed in the training, including the effects of noise on hearing. The purpose and an explanation of audiometric testing procedures will also be reviewed. An overview of hearing protection devices will be discussed, explaining their purpose, advantages, disadvantages, attenuation provided and instructions on selection, fitting, use, and care.

D. Recordkeeping

Files must be kept on training records, exposure measurements, and audiometric tests. Noise exposure records must be retained for two years. Audiometric test records are retained for the duration of an affected employee's employment. Records pertaining to the Hearing Conservation Program are maintained by EH&S.

IV. Program Responsibilities

At UT Arlington, a shared employee responsibility is required for ensuring workplace safety and meeting the requirements of the Hearing Conservation Program. These responsibilities are summarized below.

A. Employees

Employees have responsibility for participating in the medical surveillance program and ensuring that they wear HPDs when required.

B. Supervisors

Supervisors are responsible for implementing the Hearing Conservation Program requirements. A supervisor must report to EH&S any potential noise hazards and ensure that employees wear their hearing protection when required. Providing HPDs to employees is also the supervisor's responsibility. In addition, a supervisor must ensure that noise hazard areas or equipment requiring hearing protection have signs or are labeled.

C. Environmental Health & Safety

EH&S is responsible for training employees and maintaining records for those employees in the Hearing Conservation Program. Conducting exposure monitoring and notifying an employee's supervisor of noise hazards is also the responsibility of EH&S.

V. Hearing Protection

It is the supervisor's responsibility to make hearing protection devices accessible to employees, ensure they are used as required, and post "Hearing Protection Required" signs in a noise hazard area or "Hearing Protection Required" labels affixed to noise hazard equipment (see examples below).

A. Hearing Protection Devices

Employees working with loud equipment or in noise hazard areas at or above 90 dBA TWA are required to wear hearing protection devices. Several types of hearing protection meet acceptable protection criteria and EH&S can provide assistance in determining what type is appropriate.

B. Hazard Communication

Equipment generating noise levels >90 dBA and noise hazard areas must be identified through the following sign(s) posted in a noise hazard area or posted on loud equipment.

Appropriate area warning signs and equipment stickers are available through EH&S.

EXAMPLES OF LOUD EQUIPMENT	
air chisels	air hammers
air nozzles	air wrenches
compressor pumps	vacuum systems
electric and power saws	high pressure washers
power lawn mowers	electric drills (hammer drills)
garden tractors	power weed trimmers
grinding and emery wheels	heavy equipment

APPENDIX

Definitions

Audiogram
Graph of hearing threshold level (HTL) as a function of frequency.

Baseline Audiogram
The audiogram obtained from an audiometric examination administered before employment or within the first six months of employment, that is preceded by a period of at least 12 hours of quiet. The baseline audiogram is the audiogram against which subsequent audiograms will be compared for the calculation of standard threshold shift.

Decibel, A-weighted dBA
Unit representing the sound level measured with the A-weighting network on a sound level meter.

Hearing Threshold Level (HTL)
For a specified signal, amount in decibels by which the hearing threshold for a listener, for one or both ears, exceeds a specified reference equivalent threshold level.

Noise
Undesired sound. By extension, noise is any unwarranted disturbance within a useful frequency band, such as undesired electric waves in a transmission channel or device.

Standard Threshold Shift
A shift in hearing threshold, outside the range of audiometric testing variability (±10 dB), that warrants follow-up action to prevent further hearing loss.

Sound
Average rate of sound energy transmitted in a specified direction at a point through a unit area normal to this direction at the point considered.

Time-Weighted Average (TWA)
The averaging of different exposure levels during an exposure period. For noise, given an 85 dB (A) exposure limit and a 3 dB exchange rate.