

Hearing Conservation Program

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Applies To: Employees, Faculty, Students, Others

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I. Purpose

The purpose of this program is to define University requirements regarding noise exposure in the workplace. These requirements, which are based on the Occupational Safety & Health Administration (OSHA) standard **Occupational Noise Exposure** (29 CFR 1910.95), are designed to protect employees from hearing loss which could result from exposure to high levels of workplace noise. The OSHA standard requires employers to implement a Hearing Conservation Program whenever employees are exposed to occupational noise levels above the OSHA action level (an 8-hour time-weighted average of 85 dBA). In compliance with the OSHA standard, this program incorporates a Hearing Conservation Program with a primary objective of maintaining University work environments free from noise hazards that could lead to noise-induced hearing loss.

Several measures can be taken to prevent overexposure to workplace noise. The first step is to reduce the noise coming from the source itself. This may be accomplished through engineering or administrative controls, as described in [Section VIII](#) of this program. Whenever such controls are not feasible, or fail to adequately reduce workplace noise to safe levels, exposed employees will be included in this Hearing Conservation Program, requiring use of personal protective equipment, audiometric testing and training.

The University also recognizes that some employees may be at-risk for damage to hearing from exposure to noise that is of lesser intensity/duration than the OSHA action levels. These employees could include those with previous noise exposure, as well as those with some degree of hearing loss from a variety of causes. While this University program is designed to identify and modify work environments that present a potential noise hazard, all employees are urged to self-identify known or possible hearing loss so that appropriate modifications and/or protection can be arranged.

II. Scope

This program applies to all faculty, staff and student employees at the Storrs, regional and Law School campuses working at all operations, either stationary or mobile, where employees are expected to be exposed to noise levels of 85 dBA or above for 8 hours as a time weighted average.

III. Policy Statement

All employees who are exposed to workplace noise at or above the OSHA action level (an 8-hour time-weighted average of 85 dBA) must be included in the University's Hearing Conservation Program.

IV. Enforcement

Violations of this program may result in appropriate disciplinary measures in accordance with University Laws and By-Laws, General Rules of Conduct for All University Employees, applicable collective bargaining agreements, and the University of Connecticut Student Code.

V. Definitions

Action Level - Noise exposure limits, as indicated in **Table 1**, above which exposed employees must be included in the Hearing Conservation Program. As sound level increases, the allowable exposure time decreases. OSHA has a 5 dBA exchange rate that halves the allowable exposure time for every 5 dBA increase in sound level.

Table 1

ACTION LEVEL	
Sound Level (dBA)*	Duration per day (Hours)
85	8
90	4
95	2
100	1
105	1/2
110	1/4
115	1/8

At no time shall exposure to impact noise exceed 140 decibels (dB).

All employees who are exposed to workplace noise at or above these levels will be included in the University's Hearing Conservation Program.

*Levels measured on the A-scale at slow response and without regard to hearing protection worn.

Attenuation - Reduction in the loudness level.

Audiogram - A graph of the results of a hearing tone test. It shows how loud a sound has to be before an individual can hear it. The graph shows the results for sounds of varying frequencies.

Audiometric testing - A method of evaluating an exposed employee's changes in hearing over time. It consists of a baseline hearing test followed by annual testing.

Decibel (dB) - A unit of measurement of loudness of sound.

dBA - Decibel measurements read on the A-scale of a sound level meter. This scale more closely approximates human perception of sound levels.

Exposed employees - Employees whose work day routine exposes them to workplace noise at or above the action level.

Hearing Protective Devices (HPD's) - Individually worn devices, such as ear muffs and ear plugs, that attenuate (reduce) noise levels.

Potentially Hazardous Noise Environment - An environment in which workers must raise their voices in order to communicate while standing three feet away from each other.

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

VI. The University's Hearing Conservation Program

A. The Hearing Conservation Program at the University of Connecticut is designed to prevent noise-induced hearing loss through the use of engineering controls, administrative controls, hearing protective devices, annual audiometric testing and employee training. Employees exposed to workplace noise at or above the *action level* must be included in the Hearing Conservation Program.

B. Key elements of the Hearing Conservation Program:

1. Identify hazardous noise environments in the workplace through sound surveys.
2. Implement engineering and/or administrative controls to reduce workplace noise levels or worker exposure to noise.
3. Provide hearing protective devices to exposed employees whenever such controls are not feasible or fail to reduce noise levels below the action level.
4. Provide audiometric testing for exposed employees.
5. Provide training for exposed employees.

VII. Determining Noise Levels: Sound Surveys

The amount of potential damage to the ear is related to the intensity of noise and the duration of exposure. Sound surveys will be conducted to identify work environments in which the combination of noise level and exposure time could subject employees to noise at or above the *action level*. In performing sound surveys, two measuring devices may be used: the sound level meter and the dosimeter. The sound level meter measures a noise level at a given moment. The dosimeter measures the noise level over a period of time. Employees are entitled to observe these monitoring procedures if they so choose.

A. Basic Sound Survey: Initially, noise levels will be estimated using a sound level meter.

1. If measurements show that maximum noise levels fall below the *action level*, no further steps are required.
2. If measurements indicate noise levels are or could potentially be above the *action level*, a detailed sound survey is necessary.
3. If sound level meter monitoring is too difficult due to high worker mobility or fluctuating noise levels, a detailed sound survey is necessary.

B. Detailed Sound Survey: Noise level measurements will be recorded over the course of a typical work day using dosimeters which will be worn by representative employees.

1. If measurements indicate noise levels are below the *action level*, no further steps are required. However, use of engineering controls, administrative controls and/or hearing protective devices is encouraged.
2. If measurements indicate noise levels are at or above the *action level*, identified exposed employees must be included in the Hearing Conservation Program.

C. Engineering Sound Surveys: If measurements in the detailed sound survey also prove to be high, a survey of individual units of equipment, or noise sources, will be conducted in order to determine the problem areas and types of engineering controls.

Notes:

- Additional surveys should be requested if there is an increase in the use of noisy equipment or if activities or procedures change noise levels in the work environment.
- Employees exposed to noise levels at or above the *action level* must be notified of the noise survey results.

VIII. Noise Control Methods

A. Engineering Controls

The preferred method for reducing noise to safe levels is to implement engineering controls. Engineering controls modify the equipment producing the noise, the characteristics of the receiver's (exposed employee's) environment, or the path through which the noise travels. Some examples of engineering controls are the use of absorption materials, muffling devices and vibrational dampening equipment. If engineering controls successfully reduce noise to below the *action level*, affected employees will no longer be included in the Hearing Conservation Program.

B. Administrative Controls

If engineering controls are not feasible or are ineffective, administrative controls, although sometimes less desirable, may be an alternative course of action.

Administrative noise controls include replacement of old equipment with quieter new models, increasing the distance between the employee and the noise source, establishment of equipment maintenance programs and changes in employee work schedules to reduce noise doses by limiting exposure time.

C. Hearing Protective Devices (HPDs)

There are many types of HPDs available, including disposable and reusable ear plugs, canal caps and earmuffs. All have associated advantages and disadvantages and specific use, inspection and maintenance requirements. All are given a Noise Reduction Rating (NRR) which identifies how much the device will attenuate and reduce noise exposure. Contact Environmental Health and Safety to assist in choosing the correct HPD.

1. Required Use

When neither engineering nor administrative controls are feasible, or if they fail to reduce noise to acceptable levels, HPDs must be provided, free-of-charge to the employee and worn. In addition, employees who experience standard threshold shifts must also wear HPDs.

Employees must be adequately fitted for the HPDs and employers must require their use. HPDs must provide adequate attenuation as to reduce exposures to below 85 dBA. Employees must be given an opportunity to select from a variety of HPDs. Environmental Health and Safety can assist with selection and fitting of HPDs.

Prior to issuing HPDs, employees must be trained as required in [Section IX](#).

2. Optional Use

Use of HPDs is encouraged in any noisy work environment, even when employee exposures have been determined to be below the *action level*. Environmental Health and Safety is available to provide worker training on the proper selection, use and care of HPD's for University Departments that decide to issue HPD's to their employees for optional use.

D. Labeling of Hazardous Noise Areas

All departments with areas that have noise levels exceeding 85 dBA must label or post such areas to warn employees and visitors entering the area of the noise hazard and the need to wear hearing protection. In addition, stationary sources exceeding 85 dBA which are activated as needed, such as table saws, must also be labeled that hearing protection is necessary during operation. See [Appendix B](#) for examples of appropriate signage. Environmental Health and Safety can assist with selection of appropriate signage or labels.

E. Posting of OSHA standard

The affected department shall make available to employees or their representatives copies of this standard and shall also post a copy in the workplace. The link to the appropriate OSHA standard can be found in [Appendix A](#).

IX. Training and Education Requirements

All employees who are exposed to workplace noise at or above the *action level* must attend annual hearing conservation training sessions. Annual training may be provided by the outside vendor that provides the audiometric testing (see [Section X](#)).

Additionally, training is offered by Environmental Health and Safety, either as a class-based presentation or online through HuskyCT. Employees newly identified for inclusion into the Hearing Conservation Program must take a class offered by Environmental Health and Safety until initial testing and training can be provided by the outside vendor. Training topics include:

1. Effects of noise on hearing
2. Hearing protective devices (HPD's)
 - a. Purpose of HPD's
 - b. Types of HPD's and their attenuations
 - c. Advantages/Disadvantages of HPD's
 - d. Instruction on selection, use and care of HPD's
 - e. Initial fitting of HPD's
3. Purpose of audiometric testing and an explanation of test procedures.

X. Audiometric Testing

Employees who are exposed to workplace noise at or above the *action level* are required to undergo audiometric testing. At UConn, this audiometric testing is conducted by a mobile test van vendor who visits the Storrs Campus yearly. First, a baseline audiogram must be established against which subsequent annual audiograms may be compared.

Step 1: Obtain a Baseline Audiogram. Prior to annual testing, a baseline audiogram must be established. When establishing a baseline, the employer must notify the employee that they should not be exposed to workplace noise or high levels of non-occupational noise for at least 14 hours prior to the audiogram. A baseline audiogram within the first 6 months of employment is required for new employees assigned to an area in which noise exposure is expected to exceed the *action level*. Where mobile test van vendors are used to meet the testing obligation, the employer shall obtain a valid baseline audiogram within 1 year.

Step 2: Annual Audiograms. The purpose of annual testing is to detect threshold shifts so that follow-up action may be taken to prevent further hearing loss. Annual audiograms should be taken during the normal work shift in order to detect temporary threshold shifts resulting from workplace noise exposure that may lead to permanent hearing loss. All monitored employees must be informed of their audiometric test results and be provided with an explanation of these results. Copies of audiometric test data must be sent to Environmental Health and Safety. Additionally, if audiometric testing reveals that an employee has experienced a standard threshold shift (STS) follow-up action, as shown below, must be taken.

Step 3: Follow-up action if a standard threshold shift is identified:

1. Retest the employee's hearing level thresholds within 30 days to determine if the standard shift is a temporary or permanent threshold shift.
2. Referral for a clinical audiological evaluation or otological exam when problems of a medical nature are suspected.

Step 4: Follow-up action if standard threshold shift is confirmed (either by re-testing in 30 days, or by accepting initial STS results)

1. Department must re-evaluate use, fit and attenuation of hearing protective device. Environmental Health and Safety (EHS) is available to assist.
2. Department must investigate potential work-related causes, including compliance with hearing protection use and potential changes in noise level. Environmental Health and Safety can be contacted for additional sound surveys as necessary.
3. Register employee for re-training with Environmental Health and Safety (at which time EHS will complete an STS intervention record, see [Appendix C](#)).
4. Employee's supervisor must complete a [First Report of Injury](#).
5. If audiometric test data reveals a STS **and** an average loss of 25 dB or greater at 2000, 3000, and 4000 Hz, test data will identify an OSHA recordable event. This must be recorded on the OSHA 300 Log.
6. Notify employees in writing within 21 days of audiometric testing. Follow-up recommendations may be included in the written notification form.

XI. Recordkeeping

An accurate record for each exposed employee, including audiometric test results must be established and maintained. Access to all regulations and personal monitoring records described below must be granted to each employee monitored. The record must include the following information:

A. Noise Exposure Measurements

Records of all sound surveys of the work environment must be retained for a minimum of two years.

B. Audiometric tests

Audiometric tests of every employee included in the Hearing Conservation Program must be retained for the duration of the employee's employment and must include the following information:

1. Employee's name
2. Employee's job classification
3. Examiner's name
4. Test date and time
5. Test location site
6. Date of last equipment calibration
7. Audiograms / Threshold values obtained
8. Technician's comments
9. Professional Recommendations
10. Background measurements of sound pressure levels in the audiometric test room.

C. Additional Records

1. Attendance at annual training sessions
2. First Report of Injury forms
3. STS intervention records

XII. Responsibilities**A. Supervisors will:**

1. Sound Surveys
 - a. Request sound surveys for *potentially hazardous noise environments* (see [Section V](#) - Definitions).
 - b. Request additional sound surveys whenever a change in the workplace noise level may occur (due to new equipment, increased production, etc.) or if audiometric test data suggests a problem exists
 - c. Permit affected employees to observe the sound level monitoring, if they so choose.
2. Hearing Conservation Program Compliance
 - a. Identify exposed employees for inclusion into the Hearing Conservation Program
 - b. Implement engineering and/or administrative controls whenever feasible.
 - c. Send exposed employees for audiometric testing.

- i. Schedule hearing tests to establish baseline audiograms for newly-exposed employees. Notify employees that will be undergoing baseline audiograms that they must not be exposed to workplace noise for 14 hours prior to the testing. Employees should also be notified to avoid high levels of non-occupational noise 14 hours prior to testing.
 - ii. Schedule hearing tests annually to obtain follow-up audiograms. Testing should be scheduled during normal work shift hours.
 - iii. Complete follow-up actions to identified standard threshold shifts as outlined in [Section X](#).
 - d. Ensure that effective hearing protective devices are being worn by employees in required areas or while performing duties which require their use.
 - e. Post a copy of [Appendix A](#) of this program (a copy of the OSHA Noise Standard) in the workplace of the exposed employee(s).
3. Employee Notification
 - a. Inform employees about the University's Hearing Conservation Program and of their responsibilities under the program.
 - b. Notify employees of the sound survey results and make a copy accessible to them.
 - c. Notify exposed employees of their individual annual hearing test results. In the event the employee has experienced a standard threshold shift, he/she must be notified of this fact in writing within 21 days of the determination.
4. Recordkeeping
 - a. Maintain a list of high noise level areas and activities.
 - b. Maintain copies of sound survey results
 - c. Keep attendance lists of annual training sessions and STS intervention forms.
 - d. Maintain copies of annual audiometric test results for the duration of employment of the exposed employees.
 - e. Maintain records of the number of exposed employees.

B. Exposed Employees will:

1. Familiarize themselves with the University's Hearing Conservation Program.
2. Select and wear hearing protective devices in required work environments.
3. Attend annual training sessions offered by the mobile test van vendor or Environmental Health and Safety.
4. Notify supervisors of any significant change in observed workplace noise levels.

C. Environmental Health and Safety (EHS) will:

1. Written Program
Develop, implement and maintain the University's Hearing Conservation Program.
2. Sound Surveys
 - a. Identify problem areas by conducting basic and detailed sound surveys (see [Section VII](#)).
 - b. Recommend steps to be taken when noise levels are at or above the *action level*.
3. Employee Training
 - a. Provide information and training on hearing conservation and noise control for exposed employees, as necessary
 - b. Provide re-training for an STS intervention, see form in Appendix D.
4. Recordkeeping
 - a. Maintain records of sound surveys conducted in each department.
 - b. Maintain records of employee attendance at training and STS interventions.
 - c. Maintain copies of yearly audiometric test records.

D. Audiometric Testing Center (mobile test van vendor or clinic) will:

1. Comply with the mandatory appendices C - E of OSHA's 29 CFR 1910.95 standard (see [Appendix A](#) of this program) regarding audiometric measuring instruments, audiometric test rooms, and acoustic calibration of audiometers.
2. Obtain baseline and annual audiograms for employees.
3. Compare annual audiograms to the baseline audiogram to determine if a standard threshold shift has occurred.
4. Explain audiometric test results to individual employees.
5. Refer employees for a clinical audiological evaluation or otological exam when problems of a medical nature are suspected.
6. Retain records of test results for individual employees as part of their permanent files. Audiometric test results must include the information listed in [Section XI](#) of this program.
7. Forward a copy of the test results to the employer.

APPENDICES

APPENDIX A	Occupational Noise Exposure Standard
APPENDIX B	Example of Labels and Signs
APPENDIX C	Standard Threshold Shift Intervention, Record of Retraining

APPENDIX A

OCCUPATIONAL NOISE EXPOSURE STANDARD

Occupational Safety and Health Administration

U.S. Department of Labor

[29 CFR 1910.95](#)

APPENDIX B

Example of Hazardous Area Labels



Example of Loud Equipment Sign



APPENDIX C

Hearing Conservation Program

Standard Threshold Shift Intervention

Record of Retraining