

HEARING CONSERVATION PROGRAM

I. Purpose

The purpose of this program is to establish policy, procedure, and responsibilities to ensure that employees are protected from noise exposures in the workplace. This policy outlines the requirements mandated by the OSHA Occupational Noise Exposure Standard, 29 CFR 1910.95.

II. Scope

This program applies to all Worcester Polytechnic Institute employees including full-time, part-time, and temporary staff. The program will include monitoring, personal protective equipment, audiometric testing, notification, and training.

III. Application

Hearing protection shall be provided in areas where occupational noise exposure has been identified to be more than established standards.

IV. Definitions

Action level – An 8-hour time-weighted average of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of fifty percent.

Audiogram – A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

Audiologist – A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech-Language-Hearing Association or licensed by a state board of examiners.

Baseline audiogram – The audiogram against which future audiograms are compared.

Criterion sound level – A sound level of 90 decibels.

Decibel (dB) – Unit of measurement of sound level.

Hertz (Hz) – Unit of measurement of frequency, numerically equal to cycles per second.

Medical pathology – A disorder or disease. For purposes of this regulation, a condition or disease affecting the ear should be treated by a physician specialist.

Noise dose – The ratio, expressed as a percentage, of (1) 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 (2) 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).

Noise dosimeter – An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

Noise Reduction Rating (NRR) – the laboratory-based noise attenuation afforded by the given hearing protective device.

Otolaryngologist - A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

Representative exposure – Measurements of an employee's noise dose or 8-hour time-weighted average sound level that the employers deem to be representative of the exposures of other employees in the workplace.

Sound level – Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit: decibels (dB). For use with this regulation, SLOW time response, in accordance with ANSI S1.4-1971 (R1976), is required.

Sound level meter – An instrument for the measurement of sound level.

Time-weighted average sound level – That sound level, which if constant over an 8-hour exposure, would result in the same noise dose as is measured.

V. Procedures

Identification of High Noise Areas

The Hearing Conservation Program will be activated when recommended by Environmental Health & Safety or when information from a hearing evaluation indicates that an employee's exposure may exceed an action level of 85 decibels or the following exposure limits.

| OSHA's Exposure Limits (1910.95) | |
|---|--|
| Duration Per Day (hours) | Sound Level (dBA slow response) |
| 8 | 90 |
| 6 | 92 |
| 4 | 95 |
| 3 | 97 |
| 2 | 100 |
| 1.5 | 102 |
| 1 | 105 |
| 0.5 | 110 |
| 0.25 or less | 115 |

Noise Monitoring

Direct-read sound level monitoring will be performed to identify areas where hearing protection is required. Direct-read sound level monitoring will be provided by Environmental Health & Safety at the request of faculty, staff, or students. Monitoring shall be repeated whenever a change in production, process, equipment, or controls may increase noise levels. If OSHA compliant monitoring is required, the department will need to have sampling performed using a 90-dBA threshold dosimeter and compare the results to Table G-16 in 29 CFR 1910.95. The cost for dosimeter sampling is the responsibility of the department.

Hearing Protection

Appropriate hearing protection will be provided to employees working in areas that approach or exceed 85 decibels. The supervisor is responsible for providing hearing protection for all employees.

The supervisor should calculate NRR of all hearing protection devices to ensure proper protection is given to the employee. The calculation must be completed in compliance with 29 CFR 1910.95 Appendix B “Methods for Estimating the Adequacy of Hearing Protection Attenuation.” The following is a sample tutorial on how to calculate NRR.

Find the NRR located on package or box of hearing protector. Subtract 7 from the NRR rating given. Divide that number by 2. Subtract the resulting number from the measured noise exposure that the employee is working in.

Example Calculation of NRR:

$$\text{NRR from package} = 29$$

$$29 - 7 = 22$$

$$22 / 2 = 11$$

$$\text{Dept A has noise exposure of 90 TWA: } 90 - 11 = 79$$

79 dB is the exposure for the employee in Dept A with use of a hearing protector with a NRR of 29.

Notification

All employees will be notified of the Hearing Conservation Program requirements upon hire if they are assigned to a previously identified noise exposure area and subsequently in their employment if an exposure occurs. Signs will be posted in noise exposure areas exceeding established standards.

VI. Responsibilities

Department Supervisors:

- Help to identify areas where occupational noise exposure above OSHA levels may occur. EHS provides noise exposure assessments upon request.
- Provide clear labeling for employees in areas of their workplace that may exceed the 8-hour TWA of 85 decibels.
- Ensure that annual audiometric evaluations are performed for all employees who are required to work in areas where hearing protection is required. The evaluation should occur upon employment, and annually thereafter, for employees who will be assigned to areas where an occupational noise exposure has been identified.
- Contact Environmental Health & Safety to assist with scheduling audiometric testing.
- Contact Environmental Health & Safety if there is a change in process, equipment or controls that would affect noise levels, so exposure assessments can be performed to characterize sound levels.
- Purchase and maintain all hearing protection devices which provide an adequate noise reduction rating (NRR) for the noise levels which employees are exposed to. Supervisors are also required to calculate the NRR according to the provisions of this program or consult EHS on proper hearing protection devices.
- Maintain all employee noise exposure records and audiometric evaluations.

Employees enrolled in the program must:

- Wear hearing protection where it is required.
- Attend hearing protection training.

- Receive annual audiometric evaluations.
- Report suspected “high” noise areas to their supervisor for evaluation by EHS or other.
- Comply with all aspects of the Worcester Polytechnic Institute Hearing Conservation Program.

Environmental Health & Safety:

- Establish the Hearing Conservation Program for Worcester Polytechnic Institute in accordance with OSHA Occupational Noise Exposure Standard 29 CFR 1910.95.
- Review the Hearing Conservation Program periodically and revise as needed.
- Provide training for all affected employees on the proper use and purpose of hearing protection and audiometric testing and the effect of noise on hearing.
- Monitor suspected areas for noise exposure.
- Provide notice to employees on what areas of their workplace exceed the 8hour TWA of 85 decibels.
- Make recommendations to reduce noise exposure based on monitoring and audiometric evaluations and recommend appropriate types of hearing protection.

VII. Training & Testing Requirements

OSHA’s Occupational Noise Exposure Standard 29 CFR 1910.95(k) requires the following training requirements for all employees who exceed the 85 decibel level.

- Hearing conservation training shall be provided for each employee enrolled in the hearing conservation program. The following must be covered during the annual training.
 - 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.

OSHA’s Occupational Noise Exposure Standard 29 CFR 1910.95(g) requires the following testing requirements for all employees who exceed the 85 decibel level.

- Audiometric evaluations are required annually for all employees included in the Hearing Conservation Program.
- All employees who are exposed to levels at or above the action level must receive their baseline audiometric evaluation within 6 months of the first exposure.
- At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above the action level.

VIII. References

Industrial Hearing Testing, Sample Written Hearing Conservation Program. <http://www.industrialhearing.com/>

U.S. Department of Labor, OSHA Standard 29 CFR 1910.95, Occupational Noise Exposure. Occupational Safety and Health Administration.

U.S. Department of Labor, OSHA Standard 29 CFR 1910.95, Appendix B Methods for Estimating the Adequacy of Hearing Protection Attenuation. Occupational Safety and Health Administration.