

University of Rochester

Hearing Protection Program

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Scope

This program covers any University of Rochester Employee who, in the course of his/her duties, may perform work or use equipment that produces sound levels sufficient to cause hearing damage, as defined by the Occupational Safety and Health Administration (OSHA) and/or the National Institute for Occupational Safety and Health (NIOSH), or who may enter or perform work in areas where such hazardous sound levels are or may be present.

Introduction

The purpose of this program is to prevent exposure to and/or injury from potentially harmful noise levels in accordance with the University's policy of providing a workplace that is free of recognized hazards (U of R Faculty Handbook, III.M.).

This program is intended to comply with OSHA's Noise Exposure Standard (29 CFR 1910.95). The University of Rochester's Hearing Conservation Program is designed to protect employees whose duties may create hazardous noise levels or require them to work in or enter areas where the potential for high-intensity noise exposure exists.

This document provides information on the University's Hearing Conservation Program, as well as other references, including the OSHA Occupational Noise Standard in Appendix B.

Definitions and Abbreviations

Action Level: The sound exposure level at or above which employees must be enrolled in a hearing conservation program that includes exposure monitoring and audiometric testing, training, and noise reduction measures. The OSHA action level is 85 dBA, expressed as an 8-hour time-weighted average (TWA₈).

Decibel (dB): a unit of sound pressure, or intensity, measured on a logarithmic scale. Sound exposure measurements are typically rated on an "A-weighted" (dBA) scale that most closely approximates human hearing response.

Exchange Rate: The increase in noise level that results in the permissible exposure time being reduced by half. The OSHA standard uses a 5 dBA exchange rate.

Permissible Exposure Limit (PEL): OSHA sets enforceable Permissible Exposure Limits (PELs) to protect workers against adverse health effects due to exposure to hazards. PELs are regulatory limits based on an 8-hour time weighted average (TWA) exposure. The PEL for noise is 90 dBA (TWA₈).

Standard Threshold Shift (STS): A change in hearing threshold relative to the baseline audiogram, possibly indicating a degradation of hearing.

Time-Weighted Average (TWA): the average exposure, based on the duration of exposure to various sound levels, over a specified period of time, usually a nominal eight hours (TWA₈). This means that, for limited periods, a worker may be exposed to sound excursions higher than 90dBA, as long as the TWA of 90 dBA is not exceeded.

Background

The OSHA Occupational Noise Exposure Standard—29 CFR 1910.95 (a) and (b)—was enacted to protect workers against the effects of high intensity occupational noise. The original standard includes the following components:

- A Permissible Exposure Limit (PEL) of 90 dBA (TWA₈) per workday, and exposure duration limits at sound levels at or above 90 dBA (TWA₈);
- Requirements for the employer to reduce employee exposure to within this level by the use of feasible engineering/administrative controls;
- Personal Protective Equipment (PPE) will be provided to the employee and used to reduce sound levels to the specified level If engineering/administrative controls do not reduce sound levels to below the specified exposure limits;
- Combined effects of noise from varying sources must be given special consideration;
- The standard requires that distinctions between continuous and intermittent noise and associated sound levels be identified;
- Exposure to continuous steady-state noise sources is limited to a maximum of 115 dBA;
- Exposure to impact or impulse noise must not exceed 140 dBA; and,
- The hearing conservation amendment—29 CFR 1910.95 (c)(1)—requires that a “continuing effective hearing conservation program” be implemented whenever employee exposure exceeds 85 dBA (TWA₈), or an equivalent dose of 50% of the exposure limit, without regard to the use of hearing protectors. This hearing conservation amendment also requires that employees whose noise exposures at the work site equal or exceed the action level of 85 dBA (TWA₈) be included in a hearing conservation program. The components of this program are described later in this document.

The amendment—29 CFR 1910.95 (c) through (o)—details provisions dealing with monitoring employee noise exposures, annual audiometric testing for employees exposed to noise levels of 85 dBA (TWA₈) or more, re-testing under some circumstances, selection of appropriate hearing protectors, employee training and education, and record maintenance.

The University of Rochester Hearing Protection Program is available online at:

<http://www.safety.rochester.edu/ih/hearing/hearing.html>,

or may be requested in printed form by contacting Environmental Health & Safety (EH&S) at 275-3241.

Questions about the University’s program or compliance can be referred to EH&S.

Responsibilities

The Occupational Safety Unit (OSU) of Environmental Health and Safety

EH&S/OSU is responsible for:

- Maintaining the University’s written plan;
- Identifying high noise areas;
- Maintaining a list of high noise areas;
- Performing environmental sound pressure level measurements in areas of potentially excessive noise exposure, or whenever there is a change in process, equipment, or production that may affect an individual’s exposure to noise;
- Evaluating noise measurements and identifying exposures at or above the Permissible Exposure Limit (PEL) of 90 dBA (TWA₈);
- Monitoring employee exposures by dosimetry in areas where noise levels may exceed the 85 dBA (TWA₈) action level, or in cases where an employee has developed a standard threshold shift that may be work-related;
- Recommending feasible engineering controls;
- Performing noise exposure computations (29 CFR 1910.95 Appendix A);
- Estimating adequacy of hearing protectors (29 CFR 1910.95 Appendix B);
- Reporting findings to employees, appropriate department supervisors and UHS;
- Providing program oversight and making recommendations; and,
- Maintaining necessary records.

University Health Service (UHS)

UHS provides audiometric testing for University employees who work in high noise areas and are required to have their hearing tested to obtain a baseline audiogram before beginning work, and annually thereafter, until they leave the University. Anyone exhibiting an STS suspected to be a work-related hearing loss will be referred for a follow-up with an audiologist. UHS will notify EH&S of any work-related Standard Threshold Shifts (STS) identified during their examinations.

UHS trains employees and fits them with hearing protection devices at the time of their initial and annual hearing tests. UHS will work with employees to determine what device offers the best protection.

The training includes the explanation of reasons for using hearing protection, the proper use of hearing protectors, how to care for hearing protectors, requirements of the University's Hearing Conservation Program, and an introduction to audiometric testing.

UHS also:

- Verifies employees have completed Annual Hearing Conservation training.
- Administers a continuing and effective hearing conservation program that includes audiometric testing for all employees whose exposure equals or exceeds the 85 dBA (TWA₈) action level;
- Conducts baseline and annual audiograms, evaluates the audiograms for Standard Threshold Shifts, conducts retesting when necessary and provides evaluations to the employee;
- Notifies University Human Resources of Standard Threshold Shifts for recording on the OSHA 300 Log.
- Refers employees who have been identified as exhibiting an STS to an audiologist for follow-up evaluation. The audiologist notifies UHS and EH&S of the results.
- Notifying EH&S of employees exhibiting an STS for follow-up;
- Provides medical follow-up of exposure testing results when an STS has occurred and makes provisions for retesting and revising baseline audiograms where necessary;
- Provides general training and fit testing in the use of hearing protectors;
- Retrains employees in the use of hearing protection and refits them for hearing protection devices if an STS has occurred;
- Maintains an audiometric testing system that complies with the noise standard, meets with the calibration requirements of the National Standard Specification Audiometers S3.6-1969, and with the requirements described in Appendices C, D and E of the standard; and,
- Maintains necessary records.

University Human Resources/Business Partners

- Business Partners are responsible for determining the training needs for employees, and ensuring that the required training is made available to those employees.
- University HR is responsible for maintaining the OSHA 300 Log of occupational injuries/illnesses.

University Administration, Directors, and Principal Investigators

Provide administrative and financial support and direction for the University's Hearing Protection Program throughout the University and within individual departments (U of R Faculty Handbook, III.M.).

Supervisors and Managers

Individual departments must provide personal protective equipment (PPE), in the form of hearing protectors, to any employees who work in a confirmed or suspected high noise area or who use equipment or perform tasks that may generate hazardous noise levels. (U of R Faculty Handbook, III.M. and U of R Personnel Policy 158).

Supervisors and managers are responsible for:

- Making themselves familiar with the University's Hearing Conservation Program, and ensuring that employees comply with the requirements of this plan;
- Notifying EH&S of any high-noise areas, equipment, or activities that might expose their employees to excessive noise;
- Ensuring that all of their facilities have been surveyed and that all high noise areas, equipment, or work activities have been identified;
- Helping to identify employees who have the potential for exposure to sound levels that exceed the OSHA Permissible Exposure Limit (PEL);
- Ensuring that employees go to UHS for the initial and annual hearing tests, and keep any follow-up appointments;
- Enrolling eligible employees in the hearing surveillance program with University Health Service (UHS);
- Ensuring that employees identified as exhibiting an STS follow up with the audiologist within 30 days of the initial determination.
- Training employees on safe working practices;
- Ensuring, with possible assistance from EH&S, that any feasible noise attenuation measures (engineering controls) are implemented;
- Ensuring that noise exposure is reduced by means of administrative measures;
- Ensuring their employees complete Annual Hearing Conservation training.
- Ensuring that employees are trained and properly fitted for the use of hearing protectors;
- Ensuring that hearing protectors are properly used by the employees whenever required;
- Providing a clean area where hearing protectors can be stored; and,
- Maintaining necessary records.

Hearing Protection Users

In accordance with University Personnel Policy 158, employees who are covered under this Program are responsible for:

- Complying with the University of Rochester's Statement of Safety Policy (Appendix 1) and with the Hearing Protection Program;
- Completing Annual Hearing Conservation Training.
- Carrying out their duties in a manner so as to promote safe work practices;
- Consistently and correctly using the provided hearing protectors in accordance with training and Standard Operating Procedures (SOPs) whenever entering high-noise areas or performing work that could expose them to excessive noise;
- Ensuring that their hearing protectors are in good condition;
- Informing their supervisors when they need replacement hearing protectors;
- Communicating with their supervisor(s) with regard to any problems in the work process or new hazards that may compromise the effectiveness of the hearing conservation practices; and,
- Keeping all medical surveillance and audiogram appointments at UHS.
- Making and attending follow-up appointment(s) with the audiologist within 30 days when an STS has been identified during the annual audiogram at UHS.

Audiometry and Threshold Shift Assessment Process

1. Employee's supervisor/department shall notify UHS of any employee who is potentially exposed to high noise levels so that the employee(s) can be enrolled in the University's Hearing Conservation Program and baseline and annual audiograms can be obtained.

2. The employee completes annual Hearing Conservation Program training on MyPath as part of the annual health update process; this shall be done prior to his/her UHS appointment.
3. UHS conducts annual audiograms for employee in Hearing Conservation Program as part of annual health update. When going to the UHS appointment, the employee must take along documentation that he/she has completed the required training.
 - If employee has not completed HCP training, the audiogram will still be conducted and the employee's supervisor is notified.
4. If a possible STS is detected, UHS notifies the employee, EH&S, HR, and Audiologist.
 - UHS generates a referral letter, which is sent to the employee, the employee's supervisor, the Audiologist, EHS, and HR. EHS is notified by real-time email so investigation can begin immediately.
5. HR records the STS on the OSHA log
6. EHS sends an e-mail to the employee's supervisor requesting the supervisor ensure that:
 - the employee makes and keeps the Audiology appointment within 30 days of initial STS determination;
 - that the employee is provided with hearing protection equipment and training for its use if he/she will be working under high-noise conditions;
 - that the employee be monitored to ensure he/she is consistently and properly using hearing protection.
 - Feasible measures to reduce noise exposure are implemented.
7. The Audiologist conducts a follow-up examination of the employee to determine whether he/she has a standard threshold shift caused by noise exposure and whether it is work-related. As part of the follow-up appointment, the Audiologist also assesses the employee's ability to properly insert/don hearing protection equipment, and provides instruction to correct any deficiencies.
8. The Audiologist notifies EHS and HR of the results.
9. If the STS is work-related, EHS notifies the employee's supervisor that the incident is work-related, and that an Incident Report must be filed. EHS conducts additional investigation, which may include noise dosimetry.
10. If the STS is not work-related, HR removes the incident from the OSHA log.

Requirements of OSHA's Occupational Noise Exposure Standard

The following sections describe the individual requirements of the Hearing Conservation Standard. The Federal Register (48 FR 9738, March 8, 1983) discusses these topics in greater depth.

Monitoring

The hearing conservation amendment requires employers to monitor noise exposure levels in a manner that will accurately identify employees who are exposed at or above 85 dBA (TWA₈), or equivalently, a dose of 50% of the PEL. The monitoring requirement includes the following points:

- All exposure measurements shall include all noise within the 80 to 130 dBA range, and include both continuous and intermittent sources of noise;
- Some workers may experience varying sound level exposures due to high mobility, significant variations in sound levels, or significant impact noise, and area monitoring may be inappropriate. Personal sampling that is representative of the employee's exposure, produces equivalent results, and complies with the standard shall be used in these cases;

- Instruments used for monitoring employee exposure must be calibrated to ensure that measurements are accurate;
- Workers shall re-monitor exposure for sound levels whenever there is a change in continuous or intermittent noise levels due to a change in process/equipment or work assignment ;
- Employees exposed to sound levels at or above 85 dBA (TWA₈) shall be notified of the results of the monitoring; and,
- Affected employees shall have the opportunity to observe the monitoring.

Please refer to 29 CFR 1910.95 (d), (e) and (f) for a more complete review of this section.

Audiometric Testing

Audiometric testing not only monitors employee hearing acuity over time, but also provides an opportunity for employers to educate employees about their hearing and the need to protect it. The audiometric testing program includes:

- Baseline audiograms;
- Annual audiograms; and,
- Training and follow-up procedures.

Audiometric testing must be made available at no cost to all employees who exceed a 50% noise dose (the action level). A designated professional (audiologist, otolaryngologist, or physician, etc.) must be responsible for the program and meet the professional and competence standards described in the Noise Control Standard. Professional responsibilities include:

- Overseeing the program and the work of the technicians;
- Reviewing problem audiograms; and,
- Determining whether referral is necessary.

Both professionals and trained technicians (as certified by the Council of Accreditation in Occupational Hearing Conservation) may conduct audiometric testing. In addition to administering audiometric tests, the supervising professional is also responsible for:

- Ensuring that the audiometer works properly;
- Conducting audiometric tests in an appropriate test environment;
- Reviewing audiograms for Standard Threshold Shifts (STS); and,
- Identifying problem audiograms requiring further evaluation by a professional.

Audiograms

The two essential components of the medical testing program are conducting audiometric tests and evaluating all audiogram test results.

Two types of audiograms are required:

- Baseline audiogram-an audiogram performed within 6 months of an employee's first exposure to occupational noise at or above the 85 dBA (TWA₈). This audiogram serves as a reference against which future audiograms are compared. If the baseline audiogram will be obtained more than six months after the employee's first exposure at or above the action level, the employee shall wear hearing protectors until the baseline audiogram is obtained. In addition, whenever a baseline audiogram is to be obtained from an employee, the employee shall have limited noise exposure for at least 14 hours prior to testing. If necessary, hearing protectors may be used to limit the employee's exposure to noise prior to testing;

- Annual audiogram-once the baseline has been established, the employer must obtain a new audiogram within one year of the baseline, and then subsequent yearly audiograms if the employee is exposed above the Action Level.

Audiogram Evaluation

The employee's annual audiogram shall be compared to his or her baseline audiogram to determine if the annual audiogram is valid and to determine if a Standard Threshold Shift (STS) has occurred. The standard defines an STS as an average audiogram shift of 10 dBA or more at 2,000, 3,000 or 4,000 Hz in either ear.

When an audiogram is abnormal, the audiologist:

- May re-test the employee within 30 days and consider the re-test the employee's annual audiogram;
- Shall review the audiogram to determine whether further evaluation is required;
- Shall provide all information necessary to perform the evaluation including the employee's baseline and most recent audiograms, and information pertaining to test room and equipment requirements as outlined in the noise standard and its appendices.

When an STS has been identified:

- The STS shall be recorded on the OSHA 300 Log.
- The employer shall inform the employee, in writing, of the test results within 21 days of the determination;
- If the STS is determined to be work-related, the employee shall be fitted and trained for hearing protectors if he/she is not currently using them or re-fitted and re-trained in the use of hearing protectors if he/she is currently using them;
- The employee shall be referred for further clinical or audiological testing or evaluation, as appropriate, shall be examined to determine if the hearing protectors are aggravating or promoting any medical conditions, and shall be informed of any medical condition of the ear that is unrelated to the use of hearing protectors;
- If subsequent testing of the employee, exposed at or below 90dBA (TWA₈), shows that the STS is not persistent, the employer shall inform the employee of the new test and evaluation result and discontinue the use of hearing protection for that employee.

A recent or annual audiogram may be substituted for the baseline audiogram if the audiologist determines that:

- The STS identified in the audiogram is persistent;
- There has been an improvement in the employee's hearing over the baseline.

The replacement audiogram, known as the *revised baseline*, will help identify any subsequent shifts in hearing should they occur.

As defined by the standard, an STS is a shift in hearing of 10dB or more in either ear, at 2,000, 3,000 or 4,000 Hz. The standard recognizes the effects of natural aging upon hearing, and makes allowances for the application of age correction factors in evaluating an employee's annual audiogram.

In order to obtain valid audiograms, audiometric equipment and facilities must be used, calibrated and maintained according to specifications described in the noise control standard.

Please refer to 29 CFR 1910.95 (g) and (h), and that standard's appendices C, D, E and F, for a complete discussion of the audiogram and testing requirements.

Hearing Protectors and Protector Attenuation

Hearing protectors are made available to all workers exposed at or above the Action Level for noise, 85 dBA (TWA₈) at no cost to the employees. The employer shall ensure that hearing protectors are worn by employees whenever:

- Feasible engineering/administrative controls fail to reduce noise levels to 90 dBA (TWA₈) or less;
- An employee is exposed to 85 dBA (TWA₈) and has not yet had a baseline audiogram or has experienced an STS.

Employees will have the opportunity to select hearing protectors with the help of a professional trained in the selection and fitting of these devices. The protectors should be comfortable to wear and provide sufficient attenuation of noise to specified levels. The employer shall also provide:

- Training in the use and care of the protectors;
- Appropriate fitting and supervision to ensure correct use of these devices at the work-site.

Hearing protectors shall provide adequate noise attenuation for each employee. Hearing protector attenuation shall be evaluated for each specific work environment (Appendix B of the noise standard) by the employer.

The protectors must:

- Reduce noise exposure to 90 dBA (TWA₈) or less;
- Reduce noise exposure to 85 dBA (TWA₈) or less for workers who have not yet received a baseline audiogram or who have experienced an STS.

The adequacy of hearing protectors shall be re-evaluated by the employer whenever:

- There is a change in the employee's work conditions or noise exposure levels, such that the current protectors may not provide adequate attenuation;
- An STS has occurred in a worker, requiring exposure levels to be reduced through the use of PPE to 85 dBA (TWA₈) or less.

Where necessary, the employer shall provide more effective hearing protectors. 29 CFR 1910.95 (i) and (j) and corresponding appendices provide a complete discussion on hearing protectors and attenuation of noise.

Training

The University of Rochester is responsible for providing training to employees exposed to noise at or above 85 dBA (TWA₈). The training shall be repeated annually for each employee, as part of the annual health update process, and will contain information that is up to date, including any changes regarding the work environment or process, as well as changes in personal protective equipment (such as hearing protectors).

The training program shall include the following components:

- Effects of noise on hearing;

- Purpose, advantages and disadvantages of properly fitting hearing protectors for attenuating noise levels;
- Selection of hearing protectors;
- Fitting and use of hearing protectors;
- Care of hearing protectors; and,
- Purpose and procedures for audiometric testing.

The employee and/or his/her supervisor shall have access to information and materials, upon request, regarding this program including:

- Copies of the noise control standard;
- Access to training and hearing conservation materials for this program;
- Training or educational materials from this program pertaining to the noise control standard.

The employer will provide training and educational materials that best suit each situation as it pertains to noise exposure, control and hearing conservation. The training requirements are such that they will promote employee awareness and participation, and allow for routine assessment of the level of compliance of the program by the employer.

Please refer to 29 CFR 1910.95 (k) and (l) for the complete description on this section.

Record Keeping and Access to Records

The employer is responsible for maintaining records as specified in the hearing conservation amendment (29 CFR 1910.95 (m)). Recording keeping requirements of the noise control standard include:

- Maintaining noise exposure measurement records for a period of 2 years;
- Retaining hearing test records that include:
 - The name and job classification of the employee;
 - Dates of all audiometric tests;
 - Examiner's name;
 - Date of the last acoustic or exhaustive calibration of test equipment, measurements of the background sound levels in audiogram test rooms; and,
 - The employee's most recent noise exposure measurement;
- Audiometric test records must be maintained for the duration of the affected individual's employment;
- The records required by this section must also be made available upon request to affected employees and other specified individuals as described under this section and 29 CFR 1910.20 (a)-(e) and (g)-(i). For a complete discussion on record keeping, please refer to these sections of the Standard.

Appendix A-University of Rochester Faculty Handbook Statement of Safety Policy

Per University of Rochester Faculty Handbook, Statement of Safety Policy (III.M.Safety):

It is the policy of the University of Rochester to provide an environment in which recognized hazards that could cause injury or illness to faculty, staff, students, patients, or visitors are controlled and monitored, and to protect its facilities from risk of damage from unsafe acts or conditions. The safety and well-being of all persons on University property or engaged in University activities are of primary concern. Each member of the University community, including each member of the faculty, is expected to share this concern and to participate in University efforts to encourage safety and control risk in all activities. It is each person's responsibility to be alert to actual or potential hazards and to take appropriate steps to control them.

Appendix B-The Occupational Noise Exposure Standard CFR 1910.95

The OSHA Occupational Noise Exposure Standard can be found at:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9735

Appendix C-References

- 29 CFR 1910.95: Occupational Noise Exposure Standard:
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9735
- 29 CFR 1910.1020: Access to Employee Exposure and Medical Records:
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10027
- University of Rochester Human Resources Personnel Policy 158:
<http://www.rochester.edu/working/hr/policies/pdfpolicies/158.pdf>
- University of Rochester Faculty Handbook: III.M.Safety:
http://www.rochester.edu/provost/assets/PDFs/Faculty_handbook.pdf