Hearing Conservation Program

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I. **Introduction**

This document presents guidelines to protect University of New Hampshire (UNH) employees against the effects of exposures to high noise levels. The intent of the program is to prevent significant and permanent noise-induced hearing loss. The Occupational Safety and Health Administration (OSHA) Occupational Noise Exposure Standard, 29 CFR 1910.95, promulgated limits to define acceptable occupational noise exposures. The loud nature of many job tasks and machines in the workplace often create noise levels which exceed the established limits.

Situations exist where noise attenuation cannot be attained through the use of engineering or administrative control measures. In these cases, regulations require that an effective Hearing Conservation Program (HCP) be instituted. A HCP employs the use of hearing protection equipment, monitoring programs, medical surveillance, and employee training to reduce and monitor the effects of noise on employees.

II. **Definitions and Acronyms**

**“A”-Weighted Scale** – The measurement scale that approximates the loudness of tones relative to a 40 dB sound pressure level 1000 Hz reference tone. A-weighting is most responsive to frequencies, 400 – 4000 Hz and best approximates what is heard by the human ear. Measurements are expressed as dBA.

**Action Limit** – The sound level which when reached or exceeded necessitates implementation of activities to reduce the risk or noise-induced hearing loss. OSHA currently has established an 8-hour time weighted average (8-Hr TWA) of 85 dBA as the criterion for implementing an effective hearing conservation program.

**Administrative Controls** – Efforts to limit workers’ noise exposure by modifying work schedules or locations, or by modifying the operating schedule of noisy machinery.

**Baseline Audiogram** – A valid audiogram against which subsequent audiograms are compared to in determining if hearing thresholds have changed.

**Decibel (dB)** – The unit used to express the intensity of sound. The decibel scale is a logarithmic scale in which 0 dB approximates the threshold of hearing in the mid frequencies for young adults and in which the threshold of discomfort is between 85 and 95 dB sound pressure level and the threshold of pain is between 120 and 140 dB sound pressure level.

**Dosimeter** – An instrument that measures sound levels over a specified interval, stores the measurements, calculates the sound as a function of sound level and duration, and describes the results in terms of dose and time-weighted average.

**Engineering Controls** – Any use of engineering methods to reduce or control the sound level of a noise source by modifying or replacing equipment, making any physical changes at the noise sources, or along the transmission path (with the exception of hearing protectors).
Hearing Conservation Program (HCP) – The prevention or minimization of noise-induced hearing loss through hearing protection devices, the control of noise through engineering methods, monitoring, annual audiometric testing, and employee training.

Impact Noise – Used to characterize impact or impulse noise which is typified by a sound which rapidly rises to a sharp peak and then quickly fades. The sound may or may not have a “ringing” quality (such as striking a metal hamper on a metal plate or a gunshot in a reverberant room). Impact noise may not exceed 140 dBA peak sound pressure level.

NIOSH – The National Institute for Occupational Safety and Health; a federal agency that conducts research on health and safety concerns, tests and certifies respirators, and trains occupational health and safety professionals.

Noise – Any unwanted sound.

Noise Induced Hearing Loss – A hearing loss resulting from damage to the inner ear that is attributed to noise.

Noise Reduction Rating (NRR) – The NRR is a single-number rating method which attempts to describe a hearing protector based on how much the overall noise level is reduced by the hearing protector.

OSHA – The United States Occupational Safety and Health Administration.

Permissible Exposure Limit (PEL) – the OSHA permissible limit for noise is currently 90 dBA as an 8-hour time weighted average. The OSHA PEL is that value which must not be exceeded during any 8-hour work shift of a 40 hour work week.

Sound Level Meter – A device which measures sound and provides a readout in dBA of the results.

Standard Threshold Shift (STS) – OSHA utilizes the term to describe a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. It is used by OSHA to trigger additional audiometric testing and related follow up.

Time Weighted Average (TWA) – A value expressed in dBA which is computed so that the resulting average would be equivalent to an exposure resulting from a constant noise level over an 8-hour period.

III. Responsibilities

A. Office of Environmental Health and Safety (OEHS)

1. Evaluate high noise areas to determine where the potential for noise induced hearing loss exists.
2. Conduct periodic, representative monitoring of these areas to identify employees who receive exposures which exceed the Action Limit.
3. Calibrate noise monitoring equipment before and after monitoring periods.
4. Document monitoring conducted for certain areas or job tasks.
5. Maintain files of all exposure monitoring and records for employees who are included in the HCP.
6. Provide the names of employees who require audiograms to their supervisor.
7. Direct investigations into engineering and administrative controls to reduce noise exposures.
8. Evaluate and approve hearing protection equipment before purchase and issuance to employees.
9. Conduct and/or coordinate training as specified in the HCP.
10. Designate and post areas where hearing protection equipment is required.

B. Supervisors

1. Identify areas where the potential for noise exposure exists.
2. Provide for maintenance of noisy machines.
3. Coordinate the availability of approved hearing protection equipment with OEHS.
4. Purchase and issue approved hearing protection equipment.
5. Ensure that employees wear approved hearing protection equipment in areas that are designated as such.
6. Maintain records of all employees who are to be included in the HCP. Records will include employee name, job title, date of last audiogram, and job duties.

C. Employees

1. Wear approved hearing protection equipment in designated areas or for designated tasks.
2. Ensure that hearing protection equipment is maintained and kept clean.
3. Report areas or tasks associated with high noise to supervisor.

IV. Procedures

The OSHA Occupational Noise Exposure Standard, 29 CFR 1910.95 has established exposure limits to protect employees against the effects of noise. When the established exposure values are exceeded, feasible engineering or administrative controls must be instituted. When engineering or administrative controls fail to reduce noise exposures below the established levels the use of hearing protection must be used. The following sections outline the procedures used by UNH to evaluate noise levels and comply with the provisions outlined in the Occupational Noise Exposure Standard.

A. Noise Monitoring

The identification of specific areas, job titles, and work tasks which are associated with high noise exposures and possible hearing loss are critical for a successful HCP. Sound level surveys will be conducted with a calibrated sound level meter to assess areas where elevated
noise levels may be present. The meter shall be used on the “A”-weighted scale which best approximates the response characteristics of the human ear. The meter shall also be set to the slow response mode, especially in instances where noise levels fluctuate.

Should sound level meter surveys indicate potential jobs that could result in noise exposures above the Action Limit of 85 dBA personal noise dosimetry will be conducted.

Monitoring will be repeated whenever changes in equipment, facilities, and/or controls increases noise levels to the extent that additional employees may be exposed above the action level; or the attenuation provided by hearing protection may be rendered inadequate. Employees will be afforded the opportunity to observe monitoring efforts conducted at UNH.

B. Area Posting

Any area where the noise level has been determined to exceed 90 dBA TWA will be designated as a “hearing conservation” area. All employees who enter this area will be required to wear hearing protection equipment, even if the entry period is less than full shift. OEHS will identify these areas and coordinate with campus representatives the posting of warning signs.

C. Identification of Employees for Inclusion in the HCP

When monitoring indicates that an employee’s eight-hour TWA exposure exceeds the action limit for noise, that employee shall be notified and included in the HCP. If it is determined that a particular task exceeds the action limit, then all personnel who perform the task will be included in the HCP.

D. Audiometric Testing

All employees whose exposure is determined to be above the action limit (85 dBA TWA) will be notified and scheduled for audiometric testing. Testing will be performed at an occupational health or other medical facility approved by OEHS for audiometric testing.

Upon identifying an employee whose eight-hour TWA exceeds 85 dBA, EH&S will notify the individual’s supervisor who will coordinate an audiogram appointment for the employee.

Following the completion of the baseline audiogram, test results will be sent to OEHS and filed. Results of audiometric testing will be provided to the employee.

Audiometric testing will be conducted for those employees that exceed the action limit within six months of the employees first exposure. Those employees included in the HCP will also receive audiometric testing on an annual basis.

Should annual audiometric testing indicate a standard threshold shift (STS) the employee will receive a follow up audiogram. OEHS will notify the employee and his/her supervisor within 21 days if a follow up test is required. The supervisor will schedule any follow up audiograms after 30 days of the most recent audiogram. As with the baseline audiometric testing, the results will be sent to OEHS and filed along with a copy of the results provided to the
employee. Should successive testing indicates an STS, the employee will be required to wear hearing protection on the job and will be directed to a physician who will further examine the results of the audiograms.

Employees participating in audiometric testing will avoid exposure to occupational noise for 14 hours prior to the appointment to prevent a temporary threshold shift and to assure the accuracy of the test. This 14 hour “non-exposure” time may be achieved through the use of hearing protection which attenuates the noise levels below 80dBA. Each individual department will be responsible for the coordination and costs of audiometric testing for their employees covered by the provisions of the HCP.

**Note:** Audiometric testing is required to be available to all employees whose exposures equal or exceed the action limit. Employees who do not wish to participate in the audiometric testing program may decline by signing the Audiometric Hearing Test Declination form. (Appendix A)

**E. Noise Control**

Methods used to control occupational noise are dictated by conditions present in the work area. Efforts will be made to evaluate the feasibility of reducing noise levels through the use of engineering and/or administrative controls. Variables such as productivity, technology, and cost may limit the feasibility of reducing noise levels. Should engineering and/or administrative controls fail to reduce noise levels to acceptable levels or it be determined to be unfeasible, personal protective equipment in the form of hearing protection shall be selected and used. The following sections describe methods of controls that can be considered.

1. **Engineering Controls**

   Engineering controls are those physical changes to a noise source and/or the path of transmission to eliminate or reduce noise. These controls are generally accepted to be the most effective method of noise control. Types of engineering controls include but are not limited to:
   - Maintenance through the replacement of worn parts and the use of lubrication and cutting oils;
   - Substitution by the use of a more quiet machine or process;
   - Isolation of the operation or equipment;
   - Reduce vibration by reducing forces and rotational speed;
   - Dampen vibration through increased support materials;
   - Reduce transmission by using flexible mountings and ducts;
   - Reduce reverberation using absorptive materials; or
   - Set criteria when purchasing machinery, be aware of the maximum noise levels and set limits on acceptable levels

2. **Administrative Controls**

   Administrative controls are changes that occur in the workplace or schedule that are used to reduce employee exposure to noise. These can include work rotation or limiting time spent in noisy areas.
3. Hearing Protection Equipment

Personal protective equipment in the form of hearing protection is necessary when engineering or administrative controls are not feasible or adequate, and for those employees who are exposed to excessive noise or have experienced a standard threshold shift (STS). Hearing protection must be carefully selected to ensure they provide the correct noise attenuation to adequately protect employees. Should hearing protection be necessary OEHS will work with impacted departments on the selection and proper use. Requirements for hearing protection equipment are as follows:

- Hearing protection will be made available to, and is highly recommended for, those employees who are exposed to noise levels at or exceeding 85 dBA.
- Hearing protection is required for:
  1) Employees exposed to eight-hour TWA noise exposures in excess of 90 dBA.
  2) Employees in the HCP who have been diagnosed as having a STS and are exposed to eight-hour TWA noise exposures exceeding 85 dBA.
  3) Areas where posted warning signs require the use of hearing protection.

F. Training

The training and education program will provide information about the adverse effects of noise and how to prevent noise-induced hearing loss. The following topics will be covered:

1. The effects of noise on hearing;
2. Recognizing hazardous noise sources;
3. Hearing protection devices – advantages and limitations;
4. Selection, fitting, use, and maintenance of hearing protection equipment;
5. Noise monitoring;
6. Audiometric testing requirements and procedures; and
7. Review of the UNH Hearing Conservation Program.
AUDIOMETRIC HEARING TEST DECLINATION FORM

I understand that due to my occupational exposure to noise with an 8-hour time weighted average that exceeds 85 dB(A), I may be at risk of acquiring a noise induced hearing loss. I have been given the opportunity to be included in the Hearing Conservation Program that makes audiometric testing available to employees at risk. However, I decline to participate in the audiometric testing at this time.

I understand that by declining the audiometric testing, no baseline audiogram will be administered to establish whether I have suffered hearing loss as a result of occupational exposure to noise or other non-occupational factors. If I subsequently develop hearing loss and have declined the audiometric testing, I may be waiving rights and remedies that would be available to me if the hearing loss is determined to be the result of occupational exposure to noise.

If, in the future, I continue to have exposure to occupational noise that exceeds an 8-hour TWA of 85 dB(A) and I want to be included and receive audiometric testing, I will be able to receive this at no charge to me.

_____________________________________________________
Print Name

_____________________________________________________
Signature of Employee

____________________
Social Security Number

____________________
Date

If you are declining audiometric testing, please state your reason(s): ________________________
_______________________________________________________________________________
Appendix A

Audiometric Hearing Test Declination Form