



Consultants ◀ Engineers ◀ Scientists

HEARING CONSERVATION PROGRAM



Yorkville Location

2551 N. Bridge St.
Yorkville, IL 60560

P: (630) 553-3989

F: (630) 553-3990

Peoria Location

3100 N. Knoxville Ave.
Suite 204

Peoria, IL 61603

P: (309) 621-4680

F: (309) 621-4690

www.mec-us.com

Providing Quality Service Since 1994

Prepared for:

**ILLINOIS WESLEYAN UNIVERSITY
PHYSICAL PLANT**

303 E. Emerson Street
Bloomington, IL 61701

Project Location:

Date of Origin: October 2021

MEC PROJECT #: 21-09-586-I.H.
ILLINOIS WESLEYAN UNIVERSITY
303 E. Emerson Street
Bloomington, IL 61701

Table of Contents MEC
Project #: 21-09-586-I.H.

HEARING CONSERVATION

Introduction

Page 1

What is Occupational Noise Exposure?

Page 2

<i>What Monitoring is Required?</i>	<i>Page 3</i>
<i>What is Audiometric Testing?</i>	<i>Page 4</i>
<i>What Is a Baseline Audiogram?</i>	<i>Page 5</i>
<i>What Are Annual Audiograms?</i>	<i>Page 6</i>
<i>What Is an Employer Required To Do Following an Audiogram Evaluation?</i>	<i>Page 7</i>
<i>When Is an Employer Required To Provide Hearing Protectors?</i>	<i>Page 8</i>
<i>What Types of Hearing Protectors Are Available?</i>	<i>Pages 9-10</i>
<i>What Training is Required?</i>	<i>Page 11</i>
<i>What Exposure and Testing Records Must Employers Keep?</i>	<i>Page 12</i>
<i>Management and Employee Responsibilities</i>	<i>Page 13</i>

Midwest Environmental Consulting Services, Inc.
2551 N. Bridge Street Yorkville,
IL 60560
(630) 553-3989 Fax (630) 553-3990

Introduction

Illinois Wesleyan University (IWU) acknowledges that some work activities conducted by its Physical Plant and Grounds Crew (and possibly other members of IWU staff) may at times exceed the Occupational Safety and Health Administration's (OSHA) permissible exposure limit for noise, and has thus adopted the following hearing conservation program.

The objective of the IWU hearing conservation program is to minimize occupational hearing loss by providing hearing protection, training, and annual hearing tests to all persons working in areas or with equipment that have noise levels equal to or exceeding an eight-hour time-weighted average (TWA) sound limit of 85 dBA (decibels measured on the A scale of a sound level meter). A copy of this program will be maintained by all affected departments. A copy of OSHA's Hearing Conservation Standard, 29 CFR 1910.95, can be found in Appendix A of this document.

The following hearing conservation program is provided to assist IWU and employees in complying with the requirements of OSHA's Hearing Conservation Standard, 29 CFR 1910.95, as well as to provide other helpful information. It is not intended to supersede the requirements of the standard. IWU will review the standard for particular requirements which are applicable to their individual situation and make adjustments to this program that are specific to their company. IWU will need to add information relevant to their particular facility in order to develop an effective, comprehensive program.

Per noise exposure evaluations conducted in September of 2019 and July of 2021, the following job/work-task classifications have the potential to exceed the OSHA PEL for noise:

- Physical Plant / Grounds Crew – Groundskeeping activities that include, but are not limited to:
 - Operation of riding lawn mowers.
 - Operation of leaf blowers.

The following person has been designated as the administrator of IWU's Hearing Conservation Program:

Name	Title	Contact Phone #
------	-------	-----------------

What is occupational noise exposure?

Noise, or unwanted sound, is one of the most pervasive occupational health problems. It is a by-product of many industrial processes. Sound consists of pressure changes in a medium (usually air), caused by vibration or turbulence. These pressure changes produce waves emanating away from the turbulent or vibrating source. Exposure to high levels of noise causes hearing loss and may cause other harmful health effects as well. The extent of damage depends primarily on the intensity of the noise and the duration of the exposure.

Noise-induced hearing loss can be temporary or permanent. Temporary hearing loss results from short-term exposures to noise, with normal hearing returning after period of rest. Generally, prolonged exposure to high noise levels over a period of time gradually causes permanent damage.

Illinois Wesleyan University's (IWU) hearing conservation program is designed to protect workers with significant occupational noise exposures from hearing impairment even if they are subject to such noise exposures over their entire working lifetimes. This document summarizes the required component of the Occupational Safety and Health Administration's (OSHA) hearing conservation program for general industry. It covers monitoring, audiometric testing, hearing protectors, training, and recordkeeping requirements.

What monitoring is required?

The hearing conservation program requires IWU to monitor noise exposure levels in a way that accurately identifies employees exposed to noise at or above 85 decibels (dB) averaged over 8 working hours, or an 8-hour time-weighted average (TWA). IWU must monitor all employees whose noise exposure is equivalent to or greater than a noise exposure received in 8 hours where the noise level is constantly 85 dB. The exposure measurement must include all continuous, intermittent, and impulsive noise within an 80 dB to 130 dB range and must be taken during a typical work situation. This requirement is performance-oriented because it allows employers to choose the monitoring method that best suits each individual situation.

IWU will repeat monitoring whenever changes in production, process, or controls increase noise exposure. These changes may mean that more employees need to be included in the program or that their hearing protectors may no longer provide adequate protection.

Employees are entitled to observe monitoring procedures and must receive notification of the results of exposure monitoring. The method used to notify employees is left to the employer's discretion.

If done in-house, IWU will carefully check or calibrate instruments used for monitoring employee exposures to ensure that the measurements are accurate. Calibration procedures are unique to specific instruments. IWU will follow the manufacturer's instructions to determine when and how extensively to calibrate the instrument.

If a 3rd party is retained to conduct noise testing on behalf of IWU, they will be required to follow the same procedures for the calibration of all instrumentation used.

What is audiometric testing?

Audiometric testing monitors an employee's hearing over time. It also provides an opportunity for employers to educate employees about their hearing and the need to protect it.

IWU will establish and maintain an audiometric testing program. The important elements of the program include baseline audiograms, annual audiograms, training, and follow-up procedures. IWU will make audiometric testing available at no cost to all employees who are exposed to an action level of 85 dB or above, measured as an 8-hour TWA.

The audiometric testing program follow-up will indicate whether IWU's hearing conservation program is preventing hearing loss. A licensed or certified audiologist, otolaryngologist, or other physician must be responsible for the program. Both professionals and trained technicians may conduct audiometric testing. The professional in charge of the program does not have to be present when a qualified technician conducts tests. The professional's responsibilities include overseeing the program and the work of the technicians, reviewing problem audiograms, and determining whether referral is necessary.

Employees will need a referral for further testing when test results are questionable or when related medical problems are suspected. If additional testing is necessary or if IWU suspects a medical pathology of the ear that is caused or aggravated by wearing hearing protectors, IWU will refer the employee for a clinical audiological evaluation or otological exam, as appropriate. There are two types of audiograms required in the hearing conservation program: baseline and annual audiograms.

What is a baseline audiogram?

The baseline audiogram is the reference audiogram against which future audiograms are compared. IWU will provide baseline audiograms within 6 months of an employee's first exposure at or above an 8-hour TWA of 85 dB. An exception is allowed when IWU uses a mobile test van for audiograms. In these instances, baseline audiograms must be completed within 1 year after an employee's first exposure to workplace noise at or above a TWA of 85 dB. Employees, however, must be fitted with, issued, and required to wear hearing protectors whenever they are exposed to noise levels above a TWA of 85 dB for any period exceeding 6 months after their first exposure until the baseline audiogram is conducted.

Baseline audiograms taken before the hearing conservation program took effect are acceptable if the professional supervisor determines that the audiogram is valid. Employees should not be exposed to workplace noise for 14 hours before the baseline test or wear hearing protectors during this time period.

What are annual audiograms?

IWU will provide annual audiograms within 1 year of the baseline. It is important to test workers' hearing annually to identify deterioration in their hearing ability as early as possible. This enables IWU to initiate protective follow-up measures before hearing loss progresses. IWU will compare annual audiograms to baseline audiograms to determine whether the audiogram is valid and whether the employee has lost hearing ability or experienced a standard threshold shift (STS). An STS is an average shift in either ear of 10 dB or more at 2,000, 3,000, and 4,000 hertz.

What is Illinois Wesleyan University required to do following an audiogram evaluation?

IWU will fit or refit any employee showing an STS with adequate hearing protectors, show the employee how to use them, and require the employee to wear them. IWU will notify employees within 21 days after the determination that their audiometric test results show an STS. Some employees with an STS may need further testing if the professional determines that their test results are questionable or if they have an ear problem thought to be caused or aggravated by wearing hearing protectors. If the suspected medical problem is not thought to be related to wearing hearing protection, IWU will advise the employee to see a physician. If subsequent audiometric tests show that the STS identified on a previous audiogram is not persistent, employees whose exposure to noise is less than a TWA of 90 dB may stop wearing hearing protectors.

IWU may substitute an annual audiogram for the original baseline audiogram if the professional supervising the audiometric program determines that the employee's STS is persistent. IWU will retain the original baseline audiogram, however, for the length of the employee's employment. This substitution will ensure that the same shift is not repeatedly identified. The professional also may decide to revise the baseline audiogram if the employee's hearing improves. This will ensure that the baseline reflects actual hearing thresholds to the extent possible. Audiometric tests shall be conducted in a room meeting specific background levels and with calibrated audiometers that meet American National Standard Institute (ANSI) specifications of SC-1969.

When is Illinois Wesleyan University required to provide hearing protectors?

IWU will provide hearing protectors to all workers exposed to 8-hour TWA noise levels of 85 dB or above. This requirement ensures that employees have access to protectors before they experience any hearing loss.

Employees must wear hearing protectors:

- For any period exceeding 6 months from the time they are first exposed to 8-hour TWA noise levels of 85 dB or above, until they receive their baseline audiograms if these tests are delayed due to mobile test van scheduling;
- If they have incurred standard threshold shifts that demonstrate they are susceptible to noise; and;

- If they are exposed to noise over the permissible exposure limit of 90 dB over an 8-hour TWA.

IWU will provide employees with a selection of at least one variety of hearing plug and one variety of hearing muff. Employees should decide, with the help of a person trained to fit hearing protectors, which size and type protector is most suitable for the working environment. The protector selected should be comfortable to wear and offer sufficient protection to prevent hearing loss.

Hearing protectors must adequately reduce the noise level for each employee's work environment. IWU will use the Noise Reduction Rating (NRR) that represents the protector's ability to reduce noise under ideal laboratory conditions. IWU will then adjust the NRR to reflect noise reduction in the actual working environment.

IWU will reevaluate the suitability of the employee's hearing protector whenever a change in working conditions may make it inadequate. If workplace noise levels increase, employees must give employees more effective protectors. The protector must reduce employee exposures to at least 90 dB and to 85 dB when an STS already has occurred in the worker's hearing. IWU will show employees how to use and care for their protectors and supervise them on the job to ensure that they continue to wear them correctly.

What types of hearing protectors are available?

Hearing protection devices may broadly be categorized into earmuffs which fit over and around the ears to provide an acoustical seal against the head, earplugs which are placed into the ear canal to form a seal, and semi-aural devices (also called semi-insert, concha seated and canal caps), which are held against the canal entrance with a headband to provide an acoustical seal at that point. Due to the considerable variety among ear plugs, they can be further differentiated into three types: pre-mold, formable, and custom-mold.

Earmuffs normally consist of rigid molded plastic ear cups that seal around the ear using foam or fluid-filled cushions that are held in place with metal or plastic headbands. The cups are lined with acoustical material to absorb high frequency energy within the cup. Earmuffs are relatively easy to dispense since they are generally one-size devices designed to fit nearly all adult users. Nevertheless, earmuffs should be evaluated for fit when initially issued, since not every user can be fitted by all models. Earmuffs are good for intermittent exposures due to the ease with which they can be donned and removed. However, for long-term wearing it is often reported that earmuffs feel tight, hot, bulky and heavy, although in cold environments, the warming effect is appreciated.

Earplugs tend to be more comfortable than earmuffs for situations in which protection must be used for an extended period, especially in warm and humid environments. They can be worn easily and effectively with other safety equipment and eyeglasses and are convenient to wear when the head must be maneuvered in close quarters. However, they are less visible than muffs, and, therefore, their use can be somewhat more difficult to monitor. Earplugs come in a variety of sizes, shapes, and materials, but regardless of the particular model, care must be taken in inserting and sometimes preparing them for use.

When earplugs are initially dispensed, even when considering formable "One-size-fits all" devices, the fitter must individually examine each person to insure that a proper seal can be obtained.

Pre-molded earplug devices are manufactured from flexible materials such as vinyls, cured silicones and other formations. Most models are available with attached cords to help prevent loss and to improve storage and reduce contamination by permitting hanging around the neck when not in use.

Formable earplugs may be manufactured from cotton and wax, spun fiberglass, silicone putty and slow-recovery foams. Life expectancies vary from single-use products such as some of the fiberglass down products to multiple-use products, such as the foam plugs which can be washed and relatively permanent items such as the encased putties. Formable plugs are generally not available with attached cords.

The primary advantage of formable earplugs is comfort, some of the products being among the most comfortable and user-accepted used today. Formable earplugs are generally sold in one-size that usually fits most but not all ear canals. This simplifies dispensing, recordkeeping and inventory problems, but when such products are used, special attention must be given to wearers with extra-small and extra-large ear canals to make sure that the canals are not too tightly or too loosely fitted. Since these plugs usually require manipulation by the user prior to insertion, during which time the hands should be relatively clean, they may not be the best choice for environments in which the devices have to be removed or re-inserted many times during the work shift by employees whose hands are contaminated with caustic or irritating substances. Custom earmolds are most often manufactured from two-part curable silicone putties, although some are available in vinyl. Silicones are cured either by a catalyst at the time of the impression as taken by the fitter or returned to the supplier for manufacturing. Most earmolds fill a portion of the ear canal as well as the concha and pinna. The canal portion of the mold is what makes the acoustical seal to block the noise. Considerable skill and time are required to take individual impressions for each employee. The fact that custom earmolds are user specific and intended to fit only the canal for which they are manufactured, does not assure that they will provide better protection than other well-fitting earplugs.

Semi-Aural Devices - Semi-aural devices, which consist of pods or flexible tips attached to a lightweight headband, provide a compromise between earmuffs and earplugs. They can be worn in close quarters, easily removed and replaced and conveniently carried when not in use. One size fits the majority of users. Their fit is not compromised by safety glasses or hardhats. These devices are usually available with dual position (under the chin and behind the head), or universal headbands made from either metal or plastic. The tips can be made from vinyl, silicone or composites such as foam encased in a silicone blotter, and may cap, or in some cases enter the ear canal.

Semi-aural devices are principally intended for intermittent use where they must be removed and replaced on a repeated basis. During longer use periods, the force of the caps pressing against the canal entrance may be uncomfortable, but for those who prefer this type of device for extended use, better ones can offer very adequate protection.

What training is required?

Employee training is very important. Workers who understand the reasons for the hearing conservation programs and the need to protect their hearing will be more motivated to wear their protectors and take audiometric tests. IWU will train employees exposed to TWAs of 85 dB and above at least annually in the effects of noise; the purpose, advantages, and disadvantages of various types of hearing protectors; the selection, fit, and care of protectors; and the purpose and procedures of audiometric testing. The training program may be structured in any format, with different portions conducted by different individuals and at different times, as long as the required topics are covered.

All Illinois Wesleyan University employees required to wear hearing protection devices shall receive training prior to initial use and annually thereafter. The primary components of the training program include the following:

- Job classification and work-task activity which require the use of hearing protection devices;
- The effects of short-term and long-term noise exposure on hearing;
- The purpose of hearing protectors, the advantages, disadvantages and the attenuation of various types of protectors;
- Selection, fitting, use and care of hearing protection devices;
- Audiometric testing program, purposes of the program, explanation of the test procedures; and
- Training records must be made available to employees or their representatives. A hearing protection training log can be found in Appendix C.

What exposure and testing records must Illinois Wesleyan University keep?

IWU will keep noise exposure measurement records for 2 years and maintain records of audiometric test results for the duration of the affected employee's employment. Audiometric test records must include the employee's name and job classification, date, examiner's name, date of the last acoustic or exhaustive calibration, measurements of the background sound pressure levels in audiometric test rooms, and the employee's most recent noise exposure measurement.

IWU will be required to record work-related hearing loss cases when an employee's hearing test shows a marked decrease in overall hearing. IWU will be able to make adjustments for hearing loss caused by aging, seek the advice of a physician or licensed health-care professional to determine if the loss is work-related, and perform additional hearing tests to verify the persistence of the hearing loss.

Management and Employee Responsibilities

Management

1. Use engineering and administrative controls to limit employee exposure.
2. Provide adequate hearing protection for employees.
3. Post signs and warnings in all high noise areas.
4. Conduct noise surveys annually or when new equipment is needed.
5. Conduct annual hearing test for all employees.
6. Conduct hearing conservation training for all new employees.
7. Conduct annual hearing conservation training for all employees.

Employees

1. Use company-issue approved hearing protection in designated high noise areas.
2. Request new hearing protection when needed.
3. Exercise proper care of issued hearing protection.

