



INDIANA UNIVERSITY

OFFICE OF THE EXECUTIVE VICE PRESIDENT
FOR UNIVERSITY ACADEMIC AFFAIRS
University Environmental Health and Safety

Hearing Conservation Program

April 30, 2014

1.0 Introduction

1.1 Purpose

The purpose of the Indiana University Hearing Conservation Program is to prevent occupational noise exposures which could lead to noise-induced hearing loss and to comply with existing Occupational Safety and Health Administration (OSHA) regulations. Employees who experience an average exposure of 85 decibels, time-weighted average (TWA), over an 8-hour work shift are included in Indiana University's Hearing Conservation Program.

This program is written in accordance with and to promote compliance with the Occupational Safety and Health Administration (OSHA), [29CFR1910.95](#), Occupational Noise Exposure Standard.

1.2 Scope

The Hearing Conservation Program establishes requirements for all employees who are expected to be exposed to noise levels equal to or greater than an 8-hour time weighted average (TWA) of 85 decibels.

2.0 Authority and Responsibility

2.1 Environmental Health and Safety

Environmental Health and Safety (IUEHS) has the primary responsibility and authority for the implementation and enforcement of the Hearing Conservation Program and is responsible for:

1. Developing, implementing, and administering Indiana University's Hearing Conservation Program;
2. Identifying work areas and equipment within Indiana University facilities where noise levels equal or exceed 85 dBA;
3. Conducting all personal and/or area noise monitoring;
4. Notifying all employees exposed at or above an 8-hour time weighted average (TWA) of 85 decibels (dB) of the monitoring results;
5. Evaluating hearing protector attenuation for the specific noise environments in which the hearing protection devices are used;
6. Ensuring proper initial fitting of all hearing protection devices;
7. Arranging annual audiometric testing and retesting when necessary;
8. Notifying employees of their audiometric test results;
9. Ensuring a copy of the employees' audiometric test is being maintained;
10. Providing documentation of employee standard threshold shifts (STS) to IU Workers Compensation;
11. Conducting annual training for employees included in the Hearing Conservation Program; and
12. Maintaining all exposure measurement records.

2.2 Medical Evaluator

The Medical Evaluator, as identified by each respective campus, shall be responsible for:

1. Conducting and documenting audiograms for IU employees in compliance with all the requirements outlined in 29CFR1910.95 and its appendices;
2. Providing the EHS contact with written audiometric test results for all employees tested;
3. Discussing and interpreting the audiogram results with Indiana University employees when an abnormality exists which appears to be related to noise exposure at work, or at the request of the employee; and
4. Providing recommendations for medical intervention as appropriate when threshold shifts are observed.

2.3 Departments

Departments shall be responsible for:

1. Ensuring that all employees, exposed to noise levels equal to or greater than 85 dBA, have access to appropriate hearing protection devices in the work area;
2. Identifying potentially hazardous noise locations and operations and contacting EHS for a noise evaluation. This includes reporting all potential noise hazard areas, employee complaints regarding noise, indications that employees are losing their hearing, and noisy conditions that make normal conversation difficult;
3. Notifying EHS, within 6 months of employment, of any new employee who is to be included in the Hearing Conservation Program;
4. Enforcing the use of hearing protection devices and maintaining engineering and administrative controls in designated noise hazard areas;
5. Scheduling audiograms and training with EHS on an annual basis for employees who are included in the Hearing Conservation Program; and
6. The cost of the Hearing Conservation Program, including audiograms and hearing protection devices, unless specifically addressed by their respective campus as otherwise.

2.4 Employees

Employees shall be responsible for:

1. Using hearing protection as required;
2. Participating in annual audiograms;
3. Participating in annual training;
4. Inspecting and maintaining hearing protection devices;
5. Seeking replacement or repair of hearing protection devices when necessary; and
6. Assisting the Department in identifying locations or operations to which they may be exposed to loud noise.

3.0 Elements of Program

3.1 Sound Surveys and Exposure Monitoring

Employee and/or area monitoring shall be performed when exposure is suspect of being at or above the action level of an 8-hour TWA of 85 dB.

Environmental Health and Safety (EHS) will identify work areas within IU facilities where noise levels equal or exceed 85 dBA. Signs will be posted at the entrance to any work area where noise levels routinely exceed 85 dBA, requiring anyone entering the area to wear proper hearing protection. Departments that suspect they have an undiagnosed noise issue in a work area shall contact their respective campus EHS Office to schedule a noise evaluation.

Personnel who work in these areas shall have hearing protection supplied to them, shall be instructed in its proper use, and be required to wear this equipment when in these identified areas. It is the responsibility of the area supervisor or manager to ensure that these requirements are maintained.

Factors which suggest that noise exposures in the workplace may be at or above 85 dB include employee complaints about the loudness of noise, indications that employees are losing their hearing, or noisy conditions which make normal conversation difficult.

All continuous, intermittent, and impulsive/impact sound levels from 80 dB to 130 dB shall be incorporated into the noise measurement survey.

The degree of noise reduction required shall be determined by comparing the measured levels with acceptable noise levels as presented in Table 1.

Monitoring shall be repeated whenever a change in processes, production, equipment or controls increases noise exposure to the extent that additional employees may be exposed at or above the action

level or the attenuation provided by hearing protection devices being used by employees may be rendered inadequate.

Affected employees or their representatives shall be provided an opportunity to observe any noise measurements.

Employees shall be removed from the Hearing Conservation Program once noise levels have been measured and determined to be at acceptable levels.

Table 1 indicates OSHA's permissible noise exposure limits.

Table 1: Permissible Noise Exposures

<u>Duration (hours)</u>	<u>Sound Level dBA (Slow Response)</u>
8	90
6	92
4	95
3	97
2	100
1-1/2	102
1	105
1/2	110
1/4 OR LESS	115

Note: Exposures to impulsive/impact noise shall not exceed 140 dB peak sound pressure level.

3.2 Noise Control Measures

When employees are subjected to sound exceeding those levels listed in Table 1, feasible engineering and administrative controls shall be utilized as the first step in noise control. If these controls fail to reduce sound to acceptable levels, hearing protection devices shall be used. During the implementation of administrative and/or engineering controls, affected employees shall be provided with hearing protection devices and trained in accordance with this program.

3.3 Hearing Protection Devices

3.3.1 Selection and Use

Hearing protection devices (ear plugs, muffs, etc.) shall be the permanent solution only when engineering or administrative controls are considered to be infeasible or not cost effective. Hearing protection devices are defined as any device that can be worn to reduce the level of sound entering the ear.

Hearing protection devices shall be made available to all employees exposed to an 8-hour TWA of 85 dB or greater at no cost to the employees and shall be replaced as necessary.

Hearing protection devices shall be worn by any employee who is exposed to an 8-hour TWA of 85 dB or greater, and who has not yet had a baseline audiogram or has experienced a standard threshold shift. Employees shall be given the opportunity to select their hearing protection from a variety of suitable hearing protection devices.

3.3.2 *Performance Information*

Attenuation refers to the damping or decrease of noise levels as a result of wearing hearing protection devices. The hearing protection device attenuation shall be evaluated by EHS for the specific noise environments in which the hearing protection device will be used.

Hearing protection devices shall attenuate employee exposure to at least an eight hour time-weighted average of 90 dBA. For employees who have experienced a standard threshold shift (STS), the hearing protection device shall attenuate exposure at or below the action level of 85 dBA-TWA (time-weighted average).

3.4 **Audiometric Evaluations**

3.4.1 *Baseline Audiograms*

Baseline audiograms shall be performed within 6 months of an employee's first exposure at or above the action level. Employees shall wear hearing protection devices any time they are going to be exposed to workplace noise at or above the action level until a baseline audiogram is obtained.

Audiometric evaluations shall be made available at no cost to all Indiana University employees whose exposure equals or exceeds an 8-hour TWA of 85 dB. Prior to the audiogram, employees shall be informed to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.

3.4.2 *Annual Audiograms*

Audiograms shall be performed at least annually after obtaining the baseline audiogram for each employee exposed at or above the 8-hour TWA of 85 dB. Each employee's annual audiogram shall be compared to his/her baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred. If the annual audiogram shows that an employee has suffered a standard threshold shift, the employee may obtain a retest within 30 days and the retest results may be considered the annual audiogram. If a comparison of the annual audiogram retest to the baseline confirms a standard threshold shift, the employee shall be informed of this in writing within 21 days of the determination.

All audiometric tests and equipment calibration shall be performed in accordance with the criteria established by "OSHA's Occupational Noise Exposure" Standard 29 CFR 1910.95.

4.0 **Training and Recordkeeping**

4.1 **Training**

Employees who are exposed to noise at or above an 8-hour TWA of 85 dB shall receive training on the following:

1. Effects of noise on hearing;
2. Purpose of hearing protection devices;
3. Advantages and disadvantages of hearing protection devices;
4. Attenuation of various types of hearing protection devices;
5. Instructions on selection, fitting, use and care of hearing protection devices; and
6. The purpose of audiometric testing including an explanation of the test procedure.

EHS shall conduct annual training for all employees included in Indiana University's Hearing Conservation Program.

4.2 **Recordkeeping**

4.2.1 *Exposure Measurements*

All non-medical records (i.e. work area and equipment surveys) will be maintained by EHS. All personnel who routinely work in designated hazardous noise areas shall be identified and a current roster of such personnel shall be maintained by their departmental management.

4.2.2 Audiometric Tests

Records of all employee audiometric tests shall be retained for the duration of the affected employee's employment and thirty years from the date of termination. These records will be made part of the employee's health record. These records shall include:

1. Name and job classification of the employee;
2. Date of the audiogram;
3. The examiner's name;
4. Date of last acoustic or exhaustive calibration of the audiometer;
5. Employee's most recent noise exposure assessment; and
6. Background sound pressure level measurements in audiometric test rooms.

All records shall be made available upon written request to the employee or designee at any time without regard to employment status.

5.0 REFERENCES

- ACGIH, Threshold Limit Values and Biological Exposure Indices, Physical Agents, Noise, current edition
- Berger, E. H., et.al, Ed., Noise & Hearing Conservation Manual, 4th ed., Akron, OH: American Industrial Hygiene Association, 1986.
- [NIOSH, A Practical Guide to Effective Hearing Conservation Programs in the Workplace, September 1990.](#)
- OSHA, General Industry Standard, [29 CFR 1910.95](#), "Occupational Noise Exposure"

6.0 REVISIONS

New Document: April 30, 2014

7.0 Glossary

Action Level: An eight-hour time-weighted average (TWA) of 85 decibels (dB), measured on the A-scale, slow response that requires the implementation of a Hearing Conservation Program in accordance with the OSHA Occupational Noise Exposure Standard.

Administrative Controls: Efforts to change a work schedule or operations to reduce an employee's noise exposure by reducing time spent in the noisy environment.

ACGIH: American Conference of Governmental Industrial Hygienists

Audiogram: A record of a person's ability to hear at several different frequencies.

Audiometric Testing: Measurement of a person's ability to hear at several different frequencies, usually 500 to 6,000 Hz.

Baseline Audiogram: An initial valid audiogram against which subsequent audiograms are compared to determine if hearing thresholds have changed.

Competent Person: For purposes of this program, a competent person is an audiologist, otolaryngologist, or physician trained to perform and interpret audiologic testing.

Continuous Noise: Noise of a constant level as measured over at least three seconds using the "slow" setting on a sound level meter.

Decibel (dB): The unit used to measure sound pressure levels; a logarithmic scale ranging from 0 dB (threshold of hearing) through 140 dB (threshold for pain).

Decibel A-Weighted (dBA): A sound level reading in decibels made on the A-weighted scale of a sound level meter.

Engineering Controls: Use of engineering methods to reduce or control a noise source usually by modifying or replacing equipment.

Hearing Conservation Program (HCP): Implementation of noise monitoring, employee audiometric testing, and training to protect employees from work-related hearing loss.

Noise Dosimeter: An instrument worn by personnel for a specified period of time, which measures the employee's noise exposure during that time.

Noise-Induced Hearing Loss: A sensory-neural hearing loss that is attributed to noise exposure only.

Permissible Exposure Limit (PEL): The maximum allowable noise exposure per OSHA. The current PEL for noise is 90 dBA measured over an eight-hour period.

Sensory-Neural Hearing Loss: Hearing loss resulting from damage to the inner ear.

Standard Threshold Shift: Relative to a baseline audiogram, a change in the hearing threshold of 10 dB or more at 2000, 3000, and 4000 Hz.

Threshold Limit Value (TLV): The sound pressure levels and durations of exposure which workers may repeatedly be exposed without adverse effect to their hearing.