**HEARING CONSERVATION PROGRAM**

**Introduction**

In compliance with the Occupational Safety and Health Administration (OSHA) Occupational Noise Exposure Standard (***29 CFR 1910.95***), Wichita State University (WSU) shall take all precautions reasonable to protect employees from hazardous noise exposure in the workplace. OSHA identifies that a hazardous level of noise exposure is an eight-hour time weighted average exposure of 85 decibels. Employers are required to administer a hearing conservation program when employee noise exposure exceed 85 dBs.

The objective of the WSU’s Hearing Conservation Program is the identification and control of noise hazard areas and the recognition and protection of employees who have the potential to develop occupational noise-induced hearing loss.

**Scope**

WSU’s Hearing Conservation Program applies to all university employees who work in noise hazard areas or who have the potential to develop noise induced hearing loss as a result of their occupation. This includes employees with measured or projected eight-hour time weighted average noise exposures of 85 decibels or greater.

It is the intent of the university that, whenever practical or feasible, efforts to reduce or eliminate excessive noise exposure by means of engineering controls or proper work practices will precede a requirement for mandatory use of hearing protection.

The university’s primary objective is to maintain noise levels in the work areas of its employees below 85 dBA using accepted engineering control methods. However, when this is not feasible, or while such controls are being instituted or evaluated, hearing protection shall be provided to employees who may be required to work in situations where noise exposures are potentially unhealthy. The maximum Permissible Noise Exposure Level for an eight-hour time weighted average (TWA) is 90 dBA. Exposure to noise levels over 90 dBA are permissible for shorter periods of time as defined by the following chart.



The WSU Hearing Conservation Program includes the assignments of responsibilities under the program, description of elements of the program including: noise monitoring, participation, hearing protection, audiometric testing, training, and recordkeeping. This program will be reviewed and revised as necessary by WSU’s Environmental Health and Safety department.

**Definitions**

**A-weighted decibel ---** The A-weighted decibel or dBA, is a type of decibel measurement which closely represents the manner in which a human ear responds to noise.

**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) ---** The decibel is a unit of measurement of sound pressure level that is a logarithmic and dimensionless.

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

**Noise ---** In general, noise is considered to be any unwanted sound.

**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 dosimetry ---** This noise assessment technique measure an employee’s personal noise exposure and is particularly useful and applicable when employees work in numerous noisy areas for short durations at a time or perform different noisy operations on any given day.

**Noise hazard area ---** An area is considered a noise hazard area if the sound levels regularly exceed 85 dBA.

**Noise Survey ---** Noise survey is another noise assessment technique that provides valuableinformation regarding sound levels in an area. The most common type is a general noise survey which measures sound levels in A-weighted decibels (dBA).

**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 (dB0). For use with the 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.

**Standard threshold ---** 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.

**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.

**Roles and Responsibilities**

**EHS Department** is responsible for the following:

* Ensures that a written program is in place
* Reviews the program periodically and monitors to ensure compliance with this program
* Conducting noise surveys of the WSU work environment to determine areas or activities of elevated noise levels
* Determining the need for hearing protection and the need to be enrolled in the Hearing Conservation Program
* Cooperating with WSU Departments to assure compliance
* Providing training as needed to personnel on the proper use, maintenance and storage of hearing protection

**Department Head/Supervisor** is responsible for the following:

* Be familiar with the regulations and the Hearing Protection Program and

ensures that employees comply with the guidelines established by the program

* Helping identify potential areas of concern and document areas of excessive noise
* Requesting that EHS evaluate potential noise operations
* Assisting EHS in identifying employees who are over the Action Level
* Maintain a list of employees who need hearing protection in their areas and ensuring they are enrolled in the Hearing Protection Program, given training, and provided with audiometric exams
* Providing a choice of hearing protection devices to employees who require hearing protection and ensuring the hearing protection is being worn
* Posting areas known to present noise hazards with signs requiring the use of hearing protection
* Supervising staff to ensure that the Hearing Protection Program is followed

**Employees** are responsible for the following:

* Wearing any required, approved hearing protection devices in posted noise hazard areas and during tasks identified with potential noise exposure greater than 85 A-weighted decibels (dBA)
* Complying with all requirements of this program once established that they must participate
* Attending all scheduled audiogram appointments and the required initial and annual training
* Maintaining hearing protection in good sanitary condition and proper working order
* Reporting noise hazards and hearing protection problems to their supervisors

**Noise Monitoring**

In order to effectively control exposure to high levels of noise it is necessary that the noise be accurately measured according to standard procedures, equipment specifications, and that the measurements be properly evaluated against accepted criteria. The monitoring of employees for noise exposure is made up of two parts, area and personal monitoring. Area measurements are generally obtained first. If noise levels approach or are above prescribed levels, personal monitoring using dosimeters may be performed.

**Area Measurements**

In an area survey, measurements of noise levels are documented using a sound level meter to identify work areas where employees’ exposures may be above hazardous levels requiring more thorough exposure monitoring. Area monitoring is conducted using a calibrated sound level meter set to the A scale, slow response. Within the area of interest, several different locations are typically measured. Typical measurements could involve monitoring at the following locations:

* In the hearing zone at the employee’s normal work location
* Next to the noise source(s)
* At the entrance(s) to the work area
* At other locations within the area where the employee might work

When sound levels are below 85 dBA in the area, no further routine monitoring will be required for that area. Should any of the noise measurements equal or exceed 85 dBA, records shall be maintained as to the noise levels recorded, where they were taken, and the source(s) of the noise. Employees working in or near these areas may have their noise exposure (dose) determined through personnel monitoring using dosimeters.

**Personal Monitoring**

Calibrated noise dosimeters can be utilized to determine employee noise exposure levels. Each employee to be monitored will have a dosimeter place on him/her for a minimum of two hours with the microphone placed in the hearing zone. Background information will be collected from each employee detailing the job description, unusual job activities, etc., for the time period sampled. For areas where multiple employees perform similar tasks under similar conditions, as related to noise exposure, EHS shall randomly sample the workers’ noise exposure levels. The results shall then be generalized to all employees in the area. Those employees whose noise exposures equal or exceed 85 dBA on an 8-hour TWA will be enrolled in the Hearing Conservation Program.

**Re-monitoring of Hazardous Noise Areas**

All areas where noise levels equal or exceed 85 dBA shall be re-monitored whenever a change in production process, equipment, or controls takes place that may have altered the noise exposure levels. Any additional employees exposed to noise levels equal to or greater than 85 dBA on a time-weighted average shall be included in the Hearing Conservation Program. Areas where noise levels have dropped below 85 dBA, as a result of engineering or administrative controls, shall be eliminated from the monitoring program, after evaluation by sound level measurements. Employees whose noise exposure levels no longer exceed an 85 dBA time-weighted average may be removed from the Hearing Conservation Program.

**Noise Control Measures**

Where employee noise exposures can exceed 85 dBA, appropriate noise control strategies are developed and implemented. Control strategies will include engineering controls, administrative controls, and personal protective equipment (hearing protective devices).

**Engineering Controls**

Noise levels are to be reduced through engineering controls where feasible or practical. Engineering controls may include barriers, vibration damping, source isolation, and sound absorbing enclosures. When new equipment is purchased, consideration shall be given to the noise levels generated and the potential exposure of employees working with or near the equipment.

**Administrative Controls**

Where engineering controls are not practical or feasible, administrative controls must be considered. Administrative controls include: changes in work procedure, rescheduling of the noisy activity, or decreasing the duration of exposure through rotation of workers.

Clearly visible warning signs must be posted at the approaches to an area where sound levels regularly exceed 85 dBA. These warning signs must clearly indicate that the use of hearing protection is mandatory.

Where a piece of equipment or tool presents the noise hazard operator training and/or labels affixed to the equipment shall be used to reinforce the requirement for hearing protection while operating the equipment.

Regular equipment maintenance can be an important noise control measure since well-maintained equipment, can be quieter.

**Personal Protective Equipment (Hearing Protective Devices)**

Hearing protection devices (ear plugs, muffs, etc.) shall be the permanent solution to reduce exposure to excessive noise only when engineering or administrative controls are considered to be infeasible or cost prohibitive.

Hearing protective devices are defined as any device that can be worn to reduce the level of sound entering the ear. In all cases, the chosen hearing protectors shall have a Noise Reduction Rating (NRR) high enough to reduce the noise at the eardrum to below 85 dBA.

Hearing protective devices shall be provided at no cost to the employee by the individual departments and worn by all personnel when they enter or work in an area where the operations generate noise levels greater that 85 dBA, or 120 dB peak sound pressure level or greater. EHS may be contacted for assistance in the selection of proper hearing protective devices.

All hearing protective devices should be cared for and maintained following the manufacturer instructions and devices should not be shared by employees.

**Audiometer Testing**

All employees who are exposed to sound levels at or above the action level of 85 dBA (8-hour TWA) shall receive audiometric testing. This university may select an outside vendor to provide this service. Baseline audiometric testing shall be performed upon identification of an employee as a participant and within 6 months of initial exposure to the action level of 85 dBA (8-hour TWA). Audiometric testing shall be repeated annually thereafter.

Audiometric test requirements shall meet those outlined in section (h) of the OSHA Occupational Noise Exposure Standard (***29CFR 1910.95***).

It is required that the baseline audiogram be preceded by at least 14 hours without exposure to workplace noise. Time that hearing protection is worn may be included as part of the 14 hours without exposure to noise. Employees shall be notified that they need to avoid non-occupational noise exposure during the 14 hours prior to the audiometric test. This notification shall be documented.

A retest audiogram may be conducted to verify or confirm a hearing threshold result.

**Threshold Shift**

Each employee’s annual audiogram shall be compared to that employee’s baseline audiogram to determine if the audiogram is valid and if a standard threshold shift (STS) as defined by OSHA Occupational Noise Exposure standard has occurred.

If the annual audiogram shows that an employee has suffered a standard threshold shift, the university may coordinate a retest of the employee within 30 days and consider the results of the retest as the annual audiogram. The employee will be notified of the standard threshold shift within 21 days of the determination. The audiologist, otolaryngologist, or physician shall review problem audiograms and shall determine whether there is a need for further evaluation.

**Training and Information**

New employees hired into positions with documented noise exposure greater than 85 dB will receive initial hearing conservation training conducted by Department supervisor, authorized vendor, or by the EHS department. The content will be the same as the annual training (listed below).

EHS or the audiometric testing contractor shall conduct annual hearing conservation training for all affected employees. The training will include:

* The effects of noise on hearing
* The purpose of hearing protectors; the advantages, disadvantages and the attenuation of various types
* Instructions on the selection, fitting, care and use of hearing protectors
* The purpose of audiometric testing, and an explanation of the test procedures

Written information will be provided to program participants regarding this program and the Occupational Noise Exposure standard ***29 CFR 1910.95***. Copies of the standard are available from EHS.

**Recordkeeping**

The **EHS Department** will:

* Maintain records of all noise monitoring, including both personal noise dosimetry and area sound level surveys. Noise measurement records shall be retained for a least two years.
* Maintain records of employee notification of results of noise monitoring.
* Retain Audiometric test records for each participant for the duration of employee’s employment.
* Maintain records of hearing conservation training for affected employees.
* Make records available to individual employees upon request.