



# TEXAS WOMAN'S UNIVERSITY™

## Hearing Conservation Program

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## I. PURPOSE

This Hearing Conservation Program (HCP) has been developed in accordance with the U.S. Occupational Safety and Health Administration (OSHA) Occupational Noise Exposure standard (29 CFR 1910.95).

The HCP, in accordance with [University Regulation and Procedure Number 04.430](#), establishes the requirements for hearing protection procedures and policies at Texas Woman's University (TWU).

Based on current research and the [recommendations of various health and safety organizations](#), including the National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH), this program sets the TWU criterion level at a more conservative 85 dB compared to OSHA's 90 dB. In other words, TWU employees exposed to noise levels of 85 dB or greater, averaged over an 8-hour time period, must be included in this program, and engineering controls, administrative controls, and personal protective equipment must be utilized to keep exposure below this level.

The intent of this program is to instruct TWU employees of their roles and responsibilities when conducting work that exposes them to occupational noise above the 85 dB time-weighted average.

## II. DEFINITIONS

The following regulatory definitions, as specified in 29 CFR 1910.95, are relevant to the TWU HCP:

**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.

**Decibel (dB)** - Unit of measurement of sound level.

**Medical pathology** - A disorder or disease. For purposes of this program, a condition or disease affecting the ear which should be treated by a physician specialist.

**Noise dosimeter** - An instrument that integrates a function of sound pressure over a period of time in a manner that it directly indicates a noise dose.

**Otolaryngologist** - A physician specializing in diagnosis and treatment of disorders of the ear, nose, and throat.

**Sound level** - Ten times the common logarithm of the ratio of the square of the measured weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit: decibels (dB). OSHA requires SLOW time response, in accordance with ANSI S1.4-1971 (R1976), to be used for most measurements.

**Sound level meter** - An instrument for the measurement of sound level.

**Standard threshold shift** - A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hertz (Hz) in either ear. In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the Annual Audiogram.

**Time-weighted average (TWA) sound level** - That sound level which, if consistent over an 8-hour exposure, would result in the same noise dose as is measured.

### **III. COMPLIANCE**

All TWU employees and contractors are required to comply with the restrictions and limitations imposed upon them by this program when working in areas where they are exposed to occupational noise above 85 dB TWA. Employees who have been notified through training that they must wear hearing protectors in areas, or while conducting tasks, designated by Risk Management shall be subject to disciplinary action for non-compliance.

### **IV. NOISE MONITORING**

TWU is required to perform noise monitoring in order to delineate areas where employees are exposed to sound levels above 85 dB TWA. TWU will conduct both area monitoring for activities that are generally stationary and personal dosimetry monitoring where tasks involve a high level of movement.

Noise monitoring at TWU will generally be conducted using a sound level meter set to the A-scale, slow response, that has been suitably calibrated before use. Different sound level meter settings may be necessary for special circumstances, such as intermittent impact noise.

There may be additional areas or tasks that exceed these applicable thresholds that have not yet been identified through noise monitoring. TWU faculty, staff, and students are encouraged to wear hearing protection in any area or when conducting tasks with loud noises, even if they do not appear on the list below.

Monitoring shall be repeated whenever a change in production, process, equipment, or controls increases noise exposures to the extent that additional employees may be exposed to levels at or above 85 dB, or if there is evidence that hearing protection equipment may no longer be adequate. Employees or their representatives may observe any noise monitoring events upon request.

#### **A. Areas on Campus Requiring Hearing Protection**

Through noise monitoring conducted to date; TWU has determined that employees working in the following areas or conducting the following tasks for the majority of their 8-hour shift may be exposed to sound levels above 85 dB:

- Chiller Plant on the Denton campus (when working in the plant for more than 1 hour in the course of one day)
- Paint Booth in Facilities Management and Construction Service Center on the Denton campus (when working in or near the booth for more than 1 hour in the course of one day). (Only the lead painter and designated secondary user are authorized to operate the paint booth).
- Sign Shop in Facilities Management and Construction Service Center on the Denton campus (when using the sign saw for more than 4 hours in one day)
- Riding Mower operation
- Push Lawn Mower operation
- Leaf Blower operation
- Weed Trimmer operation
- Landscaping Edger operation
- Power Hedge Trimmer operation
- Tractor Mower operation
- Fairway Mower operation

## **B. Areas on Campus Where Hearing Protection is NOT Required**

Areas or tasks that have been monitored but determined not to expose employees to sound levels above 85 dB include the following:

- Deck Mower operation
- Welding Shop in Facilities Management and Construction Service Center on the Denton campus
- Boiler Plant on the Denton campus (when working in the plant for no more than 1 hour in one day)
  - Note: Testing was completed when the boiler was properly functioning. If the boiler has an issue, such as a loose bearing, then hearing protection may be required as this will likely cause the area to have a noise level over the 85 dB TWA limit.

## **C. Hearing Protection for Denton Police Officers Stationed on Campus**

TWU has identified that the Denton Police Department officers may be exposed to occupational noise at or above the 140 dB ceiling limit (the OSHA-recommended limit for impulsive or impact noise) when at the firing range or when otherwise discharging weapons. These employees are required to wear appropriate hearing protection and must be supervised to ensure proper use for the full duration of noise exposure when such events are able to be reasonably predicted.

## **V. ADMINISTRATIVE AND ENGINEERING CONTROLS**

When it is determined that employees working in a particular area or conducting a particular task are exposed to sound levels above 85 dB, TWU will first attempt to control the associated noise through administrative and engineering controls. If feasible administrative (e.g., employee rotation) and engineering controls (e.g., sound absorbing materials, ceiling baffles, anti-vibration mounts, and mufflers) do not sufficiently reduce the sound level in the area to below 85 dB, employees assigned to those areas shall be included in the audiometric testing and training portions of the HCP. Employees exposed to sound levels above 85 dB shall be informed during the mandatory training.

## VI. HEARING PROTECTORS

If, after implementation of administrative and engineering controls, employees are found to be exposed to sound levels at or above 85 dB TWA, TWU shall provide personal hearing protectors. A variety of hearing protectors shall be made available by TWU to ensure equipment suitable for all affected employees is available. Use of hearing protectors shall be **mandatory** for all employees exposed to sound levels at or above 85 dB TWA.

Only hearing protectors with sufficient attenuation capability to reduce employees' noise exposure below 85 dB TWA shall be provided. Hearing protectors list a Noise Reduction Rating (NRR) on the packaging, which is the manufacturer's claim of noise exposure reduction in dB. However, OSHA regulations require that the attenuation capability of hearing protectors be determined by subtracting 7 dB from the NRR listed on the packaging. The remainder is then subtracted from the noise monitoring results to determine if the hearing protector in question is sufficient to reduce the noise exposure to below 85 dB.

NIOSH recommends derating the NRR by a multiplicative factor of 75% for earmuffs, 50% for slow-recovery formable earplugs, and 30% for all other earplugs. This means subtracting 25% from the NRR for earmuffs, 50% for foam plugs and 70% for other earplugs. This variable derating scheme considers the real-world performance of most different types of hearing protectors. This derating scheme does not affect the 7-decibel dBC-to-dBA correction, as it is applied to the NRR only. Derating is not applied to custom or "make in place" earplugs, which are entirely dependent on the quality of the ear impression and thus range from extremely effective to completely ineffective.

### An Example of Reducing the NRR

8-hour TWA noise exposure: 93 dBA  
NRR of hearing protectors: 29 dB  
Subtract 7 dB from the NRR:  $29 \text{ dB} - 7 \text{ dB} = 22 \text{ dB}$   
Divide by 2:  $22 \div 2 = 11 \text{ dB}$   
Subtract 11 dB from the  
8-hour TWA noise exposure:  $93 \text{ dBA} - 11 \text{ dB} = 82 \text{ dB}$   
Decide if 82 dB (known as the "Protected Exposure")  
is below the PEL for noise

In the example on the left, assume that 85 dB is used in the calculation as the PEL;

Another foam plugs example:

Estimated exposure (dBA) = TWA (dBA) - [(NRR - 7) x 50%]

## VII. AUDIOMETRIC TESTING PROGRAM

All TWU employees exposed to sound levels above 85 dB must be included in the audiometric testing program. The audiometric testing program consists of Baseline Audiograms and Annual Audiograms provided by TWU at no cost to employees. Within 6 months of an employee's first exposure at or above the 85 dB, a valid Baseline Audiogram shall be established against which subsequent audiograms can be compared. Annually thereafter, an audiogram shall be obtained for comparison to the Baseline Audiogram.

In order to obtain valid audiograms, TWU employees are required to avoid loud noises, both occupational and otherwise, for at least 14 hours. If an employee is unable to avoid occupational noise in the 14 hours prior to the audiogram, hearing protectors shall be provided for their use.

If, in comparing the Annual Audiogram to the Baseline Audiogram, it is determined that a Standard Threshold Shift has occurred, TWU will notify the affected employee in writing within 21 days. Unless a physician determines that the Standard Threshold Shift is not work related or aggravated by occupational noise exposure, one of the following shall occur:

- The employee shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation, if necessary.
- The employee shall be referred for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if it is suspected that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
- The employee will be informed of the need for an otological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.

TWU may require another audiogram within 30 days if it appears that a Standard Threshold Shift has occurred to determine if the Standard Threshold Shift is not persistent.

An Annual Audiogram can be substituted for the current Baseline Audiogram if the medical professional evaluating the audiogram determines that the Standard Threshold Shift is persistent, or the hearing threshold shows significant improvement over the Baseline Audiogram. Audiometric testing and audiogram comparisons shall be conducted by medical



professionals in accordance with 29 CFR 1910.25(g)(3) and 29 CFR 1910.25 Appendix C. Copies of the applicable regulations shall be provided to the medical professional conducting the test, as is necessary.

Employees should understand that due to their occupational and/or educational exposure to noise above applicable thresholds, they may be at risk of damaging hearing or experiencing a Standard Threshold Shift. This HCP provides the opportunity to have a Baseline Audiogram test and audiograms annually thereafter, at no charge to employees. Although not recommended, employees may choose to decline these audiometric tests. See Appendix A for more information.

## **VIII. TRAINING**

TWU employees exposed to sound levels at or exceeding 85 dB TWU will be required to attend training covering, at a minimum, the following:

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

The OSHA Occupational Noise standard (29 CFR 1910.95) will also be posted where employees can review it.

## **IX. RECORDKEEPING**

Audiometric test records shall be maintained for the duration of an employee's employment with TWU and shall include the following information:

- Name and job classification of the employee.
- Date of the audiogram.
- The examiner's name.
- Date of the last acoustic or exhaustive calibration of the audiometer.
- Date of the employee's most recent noise exposure assessment.
- Records of the measurements of the background sound pressure levels in audiometric test rooms.

The majority of this information shall be provided to TWU by the medical professional who conducts the audiometric testing.

Noise monitoring records shall be maintained on site for at least two years. An employee's own audiometric test records and TWU noise monitoring records will be made available to employees, former employees, and representatives designated by the individual employee upon request. Audiometric test records, or documentation of employee's declination, shall be retained for the duration of the affected employee's employment.

***Workplace safety is in everyone's best interest. Any violations of this program, or any other programs or standards, should be reported immediately to Risk Management.***

## APPENDIX A



### Annual Audiometric Testing Declination Form and Waiver of Liability

I understand that due to my occupational and/or educational exposure to noise above applicable thresholds, I may be at risk of damaging my hearing or experiencing a Standard Threshold Shift. I have been given the opportunity to have a Baseline Audiogram test and audiograms annually thereafter, at no charge to myself. However, I decline these audiometric tests at this time. I understand that by declining these tests, I **increase the risk of damage to my hearing** if I am exposed to noise levels above applicable thresholds. I understand that if I experience a Standard Threshold Shift, and I have not taken the recommended hearing test(s), I will not be aware of such Shift, and therefore will not be alerted to take the recommended measures as described in the TWU Hearing Conservation Program. I agree that in areas with known noise levels above applicable thresholds, such as firing ranges, I will use proper hearing protection and agree to be supervised at all times to ensure proper hearing protection use when such events are able to be reasonably predicted.

Name (Print) \_\_\_\_\_

Employee Signature \_\_\_\_\_ Date \_\_\_\_\_

Department \_\_\_\_\_ Job Title \_\_\_\_\_