



FINANCE &
ADMINISTRATION

Environmental
Health & Safety

Hearing Conservation Program





This Space is Intentionally Left Blank



Table of Contents

1. Purpose and Applicability	4
2. Roles and Responsibilities	5
3. Exposure Monitoring and HCP Enrollment	7
4. High-Noise Areas, Tasks, and Signage	8
5. Control Measures	9
6. Hearing Protection Devices (HPDs)	10
7. Medical Surveillance and STS Follow-Up	12
8. Training and Access to Information	13
9. Recordkeeping and Compliance Audits	14
Appendix A: Definitions	16
Appendix B: Signage Example	17
Appendix C: OSHA Table G-16 (Permissible Noise Exposures)	18

1. Purpose and Applicability

1.1 Program Objectives

Per the U.S. Occupational Safety and Health Administration (OSHA) Occupational Noise Exposure Standard, 29 CFR § 1910.95, the objectives of the Hearing Conservation Program (HCP) are: 1) to identify employees with the potential for exposure to high noise levels, and 2) to reduce worker exposure to noise to prevent noise-induced hearing loss.

The HCP achieves these objectives by evaluating potentially hazardous noise exposures, reducing exposures through feasible engineering and administrative controls, and ensuring affected employees receive appropriate noise exposure monitoring, audiometric testing, training, and hearing protection.

1.2 Scope and Applicability

The HCP applies to all Texas Christian University (TCU) organizational units and work locations, including Main Campus, the Burnett School of Medicine, University-owned or controlled property, University-leased space, and temporary field, project, research, or operational locations under the direction or control of university personnel. It covers all university employees who may be exposed to high noise levels that meet the requirements as defined in **Section 1.4**. Inclusion in the HCP shall be based on exposure evaluation and not solely on job title, department, or work location.

Areas may include, but not limited to:

- Central utility plant / boiler plant / chiller plant
- Mechanical rooms, pump rooms, and compressor rooms
- Machine shops, fabrication shops, sheet metal shops, and welding areas
- Maintenance and operations shops, including Facilities, Trades, and Garage operations
- Grounds and landscape equipment storage and staging areas
- Research laboratories with high-pressure, high-speed, or high-frequency equipment, including vacuum pumps, centrifuges, chillers, and gas compressors
- Animal care and use facilities
- Generator enclosures and areas near operating generators

Activities may include, but not limited to:

- Operating stationary or portable power tools
- Working near loud equipment such as pumps, fans, air handlers, chillers, and compressors
- Grounds operations involving mowers, blowers, trimmers, edgers, or chainsaws
- Construction, renovation, demolition, and contractor oversight activities
- Heavy equipment operation, including skid steers, loaders, lifts, and tractors
- Carpentry, concrete cutting or drilling, metalworking, and welding
- Use of pneumatic tools and compressed air equipment
- Working near generators during outages, maintenance, or testing
- Music, performance, or event support activities where occupational sound levels may be elevated

1.3 Regulatory Standard

The framework of the HCP is developed in accordance with the U.S. Occupational Safety and Health Administration (OSHA) Occupational Noise Exposure Standard, 29 CFR § 1910.95. This program defines the University's requirements for noise exposure assessment, exposure control, audiometric testing, the use of hearing protection, employee training, and recordkeeping.

1.4 Institutional Exposure Limits (Action Level)

TCU shall administer the HCP whenever employee occupational noise exposures equal or exceed an 8-hour time-weighted average (TWA) sound level of 85 decibels measured on the A scale, slow response (85 dBA), or, equivalently, a 50 percent noise dose.

For the purposes of this program, TCU establishes 85 dBA as the University's hearing conservation action level. Although OSHA's permissible exposure limit (PEL) for an 8-hour TWA is 90 dBA, TCU uses the 85 dBA action level as a proactive program threshold for identifying, evaluating, and managing employee noise exposures. See **Appendix C**: OSHA Table G-16 for federal permissible exposure limits. This approach is consistent with recommendations from the National Institute for Occupational Safety and Health (NIOSH) and applicable guidance from the American Conference of Governmental Industrial Hygienists (ACGIH).

For the purposes of the HCP, employee noise exposures shall be evaluated without regard to any attenuation provided by hearing protectors. Exposure to impact or impulse noise, defined as loud, short-duration bursts typically lasting less than one second, shall be strictly controlled. Impact or impulse noise exposure shall not exceed 140 dB peak sound pressure level.

2. Roles and Responsibilities

An effective Hearing Loss Prevention / Hearing Conservation Program requires shared responsibility among university leadership, supervisors, Environmental Health & Safety (EHS), the audiometric testing provider, and participating employees/students.

2.1 Responsibility Summary (Matrix)

Role	Primary Responsibilities
TCU Environmental Health & Safety (EHS)	Administer the overall HCP; conduct/coordinate noise monitoring and dosimetry; maintain calibrated equipment; evaluate and recommend engineering/administrative controls; designate high-noise areas; maintain program and monitoring records; deliver training as required; coordinate annual campus-wide employee audiometric testing; and conduct periodic compliance audits.
University Units / Departments / Supervisors	Identify hazards; request EHS evaluations; implement feasible controls ("buy quiet"); ensure hearing protection is provided, worn, and maintained; enforce signage; schedule audiometric testing when required outside of the annual campus-wide testing; ensure annual training is completed; and maintain local personnel rosters.
Audiometric Testing Provider	Conduct baseline and annual audiometric testing (OSHA compliant); compare results to identify Standard Threshold Shifts (STS); calibrate testing equipment; and provide necessary documentation to EHS.
Employees, including Student Workers	Follow all HCP procedures and signage; properly wear, inspect, and store hearing protection; attend scheduled audiometric testing; comply with the 14-hour pre-test quiet period; complete annual training; and promptly report any hearing concerns or equipment issues.
Temporary Workers / Contractors	Comply with posted requirements, site rules, and task-specific controls; wear required hearing protection. (Host departments must communicate these hazards and coordinate protective responsibilities with the external entity.)

2.2 Environmental Health & Safety (EHS)

EHS administers the university HCP by providing program oversight, technical assistance, and compliance support. EHS is responsible for the following

1. Maintaining the written HCP, evaluating overall program effectiveness, and conducting comprehensive compliance audits, as defined in **Section 9.6**, to inspect high-noise areas and review departmental records.
2. Conducting or coordinating noise monitoring, including area surveys and personal dosimetry; recommending employee inclusion in the HCP based on monitoring results; and repeating monitoring when workplace changes occur that may affect noise exposure.

3. Conducting Job Hazard Analyses (JHAs), either directly or through external consulting vendors, to identify specific noise hazards, evaluate tasks, and recommend task-specific controls.
4. Collaborating with departments and TCU Facilities to evaluate the technical feasibility of engineering controls and to recommend administrative controls and task-appropriate hearing protection.
5. Coordinating and scheduling annual audiometric testing with the university's approved medical provider. EHS will provide department leadership with specific testing dates for enrolled employees. For employees who are hired outside the annual testing schedule or who miss the mobile testing unit, EHS will email the employee directly with instructions and authorization to visit an approved off-site clinic.
6. Developing and delivering mandatory hearing conservation training through online modules and instructor-led, in-person sessions to accommodate departmental operations.
7. Maintaining and calibrating university noise monitoring instruments.
8. Supporting hearing protector selection, fit testing, and follow-up evaluations when audiometric findings indicate a potential Standard Threshold Shift (STS).
9. Maintaining university-level records for exposure monitoring and program administration in accordance with applicable OSHA recordkeeping requirements.

2.3 University Units / Departments / Administrators/ Managers / Supervisors

The employing unit/department has primary responsibility for ensuring personnel within its area are protected from hazardous noise and that the requirements of the HCP are implemented. Department leadership and supervisors shall:

1. Identify potential and existing noise hazards through workplace observations, task reviews, employee reports, or other relevant information, and request an EHS evaluation whenever employee exposures may equal or exceed the action level.
2. Implement feasible engineering and administrative controls to reduce noise exposure, incorporating "buy quiet" considerations into equipment selection, maintenance, scheduling, and process design. Hearing protection shall not be used as a substitute for feasible controls where such controls are required by OSHA.
3. Ensure hearing protectors are made available at no cost to affected employees, are used when required, and are replaced when damaged, worn, or no longer effective.
4. Ensure employees are informed of monitoring results, high-noise areas are properly posted, and departmental procedures address high-noise tasks and equipment.
5. Ensure enrolled employees are scheduled for baseline and annual audiometric testing at no cost, and that required hearing conservation training is completed upon assignment and at least annually thereafter.
6. Maintain a current roster of covered personnel, notify EHS of workplace or personnel changes that may affect employee noise exposure, and conduct periodic self-checks of HCP implementation to correct deficiencies in a timely manner.

2.4 Audiometric Testing Provider

The audiometric testing provider shall:

1. Conduct audiometric testing in accordance with 29 CFR§ 1910.95(g) and (h), performed by a licensed or certified audiologist, otolaryngologist, physician, or qualified technician operating under required professional supervision.
2. Establish valid baseline audiograms and perform annual audiograms for covered employees in accordance with OSHA-required timing and technical criteria.
3. Compare annual audiograms to baseline audiograms to identify potential standard threshold shifts, providing timely results and professional recommendations to the University for required employer follow-up.
4. Maintain, function-check, and calibrate audiometric equipment, and conduct testing in rooms that meet applicable OSHA audiometric testing requirements.
5. Provide the documentation needed by the University to meet OSHA recordkeeping and employee follow-up obligations.

2.5 Employees / Student workers in the HCP

Employees, including student workers covered by the HCP, are responsible for the following:

1. Following this program and applicable departmental procedures for controlling noise exposure, including wearing hearing protection in designated areas, during identified high-noise tasks, and whenever directed by a supervisor.
2. Maintaining hearing protectors in sanitary and serviceable condition, storing them properly, and requesting replacement when they are damaged or no longer effective.
3. Completing required hearing conservation training upon assignment and annually thereafter.
4. Attending scheduled baseline and annual audiometric testing appointments.
5. Complying with the 14-hour quiet period requirement prior to the baseline audiogram by avoiding workplace noise and high-level non-occupational noise exposure during that period, or by using hearing protection as directed when a quiet period cannot be achieved.
6. Promptly reporting hearing concerns, symptoms, hearing protector problems, and workplace changes that may affect noise exposure to their supervisor.

2.6 Temporary Workers / Contractor

When temporary workers or contractors perform work in university-controlled areas where hazardous noise may be present or hearing protection requirements apply:

1. The host department shall communicate known site-specific noise hazards, applicable restrictions, and required protective measures before work begins and whenever conditions change.
2. The University and the temporary staffing agency or contractor employer shall clearly define responsibilities for training, hearing protection, audiometric testing, and related safety and health obligations.
3. Where temporary workers are assigned to tasks with potential noise exposure at or above the action level, the host department shall coordinate with the staffing agency, so workers receive the same level of hazard communication and protection expected for university employees performing comparable work.
4. Temporary workers and contractors shall comply with posted requirements, university safety rules, and supervisor or project manager direction regarding hearing protection, restricted areas, and task-specific controls.

3. Exposure Monitoring and HCP Enrollment

The University shall identify, evaluate, and document occupational noise exposures whenever information indicates that an employee's exposure may equal or exceed an 8-hour TWA of 85 dBA, measured on the A-scale using slow response. Exposure monitoring shall be used to identify high-noise areas and tasks, determine employee inclusion in the Hearing Conservation Program, establish hearing protection requirements, and support the evaluation of feasible engineering and administrative controls. Monitoring may be initiated based on known noisy equipment or operations, employee concerns, changes in work practices, new or modified equipment, prior sampling results, incident review, or departmental request.

3.1 Initial Area Monitoring and Noise Mapping

EHS shall conduct initial area monitoring to evaluate fixed locations, rooms, shops, utility spaces, grounds operations, and other work areas using a sound level meter configured for A-weighting and slow response. This monitoring identifies specific equipment, tasks, or areas that may produce hazardous noise levels and helps determine where hearing protection is required.

3.2 Personal Dosimeter for Variable or Mobile Work

Where employee mobility, intermittent equipment uses, or changing sound levels make area monitoring insufficient, personal dosimetry shall be used.

3.3 Repeat Monitoring and Reassessment

Noise monitoring shall be repeated whenever a change in equipment, process, controls, work location, or job duties may increase employee noise exposure or affect the adequacy of hearing protection currently in use. Follow-up monitoring shall be conducted after the implementation of engineering or administrative controls to verify effectiveness.

3.4 Equipment Calibration

All equipment used for monitoring, such as dosimeters and sound level meters, must be calibrated within manufacturer specifications before use. EHS shall maintain documentation of applicable calibration information for all monitoring activities.

3.5 Employee Notification, Observation, and Documentation

The University shall notify each employee whose exposure is determined to be at or above an 8-hour TWA of 85 dBA of the monitoring results promptly after the results are received. Affected employees or their representatives shall be given the opportunity to observe noise measurements. EHS shall maintain documentation of all required noise monitoring activities in accordance with OSHA recordkeeping requirements.

3.6 Removal Process

Because university operations involve reassignment, seasonal work, and equipment replacement, employee participation in the HCP may change over time. Employees may be removed from the program when exposure assessment demonstrates that occupational noise exposure no longer equals or exceeds the 85 dBA 8-hour TWA action level, and the employee has remained below that level for at least one year following the last required annual audiogram. Removal from the program shall require documented review and approval by EHS based on updated exposure assessment, work assignment, and operating conditions.

4. High-Noise Areas, Tasks, and Signage

4.1 Identification of High Noise Areas and Tasks

Based on noise monitoring results, task observations, equipment characteristics, historical sampling information, and operational conditions, EHS shall designate specific rooms, shops, plants, utility spaces, grounds operations, equipment, or job tasks as high-noise areas or tasks. These designations may apply to permanent work areas, intermittent operations, mobile equipment, or task-based activities. EHS shall maintain a current master list of identified high-noise areas and tasks and shall update that list when monitoring results or operating conditions change.

4.2 Areas Requiring Hearing Protection

Employees must wear appropriate hearing protection in any area designated by EHS with noise hazard signage, or while operating specific equipment designated as hazardous, in accordance with the strict PPE requirements detailed in **Section 6.1** of this program.

4.3 Areas or Tasks Not Currently Requiring Hearing Protection

The university may maintain a list of evaluated areas or tasks not currently determined to require hearing protection under normal operating conditions. The absence of an area or task from a posted or maintained list shall not be interpreted to mean that no noise hazard exists. Employees and supervisors must notify EHS if an unlisted area or piece of equipment may create excessive noise exposure.

4.4 Signage and Hazard Communication

The university shall use noise hazard signage as an internal administrative control. Signage must be posted in areas where noise levels routinely equal or exceed 85 dBA. The signs must be clearly visible and contain specific terminology based on the hazard level:

1. **Sign Placement:** Signs shall be placed so they are clearly visible to affected employees before entering the area or beginning the task (e.g., at room entrances, on specific equipment, or at temporary work areas).
2. **Communication Methods:** In addition to posted signage, the university may use departmental task lists, shop postings, equipment labels, job hazard analyses, and work procedures to communicate task-based exposures.
3. **Sign Types and Wording:** Wording shall be concise and consistent with recognized safety-sign principles (ANSI Z535). Examples include:
 - a. **Notice:** Post this sign at the entrance to areas where noise exposure may exceed 85 dBA TWA₈.
 - b. **Caution:** Post this sign near specific equipment that generates noise at or exceeding 85 dBA.

- c. **Warning:** Post this sign in areas where noise exceeds 115 dBA, even intermittently.

Note: Refer to Appendix B: Signage Examples for visual templates of approved signage.

4.5 Signage Responsibilities and Review

The effective use of noise hazard signage relies on coordinated efforts between EHS and university departments to ensure hazards are accurately communicated and managed. To maintain compliance and safety, both parties must adhere to the following ongoing steps:

1. **Determine and Standardize (EHS):** Evaluate monitoring data, task reviews, and work conditions to determine exactly where signs are required, establish standard formatting, and coordinate their initial placement.
2. **Maintain and Enforce (Departments & Supervisors):** Keep posted signs in good, highly visible condition, consistently enforce hearing protection requirements within those designated areas, and promptly notify EHS when noisy operations are added or altered.
3. **Review and Update (Shared):** Systematically review all hazard signage whenever equipment, processes, or monitoring results change. Signs must be promptly revised or removed when updated exposure data shows the hazard no longer exists or when a temporary elevated-noise task has concluded.

5. Control Measures

The university evaluates noise controls using a strict hierarchy of preference: Elimination of the source, Substitution with quieter equipment, engineering controls, administrative controls, and finally, personal protective equipment (Hearing Protectors). Engineering and administrative controls are the preferred means of reducing occupational noise exposure; hearing protection shall not be considered a substitute for feasible controls where OSHA requires such controls to be implemented.

5.1 Equipment Purchasing & Maintenance

The university incorporates "buy quiet" considerations into equipment purchasing, replacement, renovation, and project design whenever feasible. Prior to purchasing equipment, departments should obtain operational noise levels from the manufacturer. Furthermore, **the employing department or unit that owns the equipment is financially and operationally responsible for its regular preventive maintenance.** Tasks such as the lubrication of moving parts, balancing of unbalanced equipment, and replacement of worn components must be performed routinely by the owning department to ensure equipment does not degrade and increase in noise levels over time.

5.2 Engineering Controls

Engineering controls are physical modifications to equipment, facilities, or work processes at the noise source or along the transmission path that reduce the noise level at the employee's ear. Engineering controls provide the most reliable long-term reduction in occupational noise exposure and should be evaluated first. These controls may include:

- Installing mufflers, silencers, sound barriers, and acoustic shielding.
- Utilizing equipment enclosures or isolation techniques.
- Applying vibration isolation, anti-vibration mounts, insulation, and damping materials.
- Relocating noisy equipment or processes away from employee work areas.

5.3 Administrative Controls

Administrative controls are changes in the workplace, scheduling, staffing, or task assignment intended to reduce the worker's exposure to noise. Because noise exposure is dose-based, administrative controls can reduce an employee's overall time-weighted average (TWA) even when the sound source cannot be fully mitigated. These controls may include:

- Operating noisy machines or scheduling loud work during shifts when fewer people are exposed.
- Rotating employees assigned to louder tasks or limiting the amount of time a person spends at a noise source.
- Restricting access or increasing the physical distance between employees and noisy equipment.
- Providing quiet areas where workers can gain relief and recover from hazardous noise sources.

5.4 Feasibility Evaluation, Funding, and Implementation

When monitoring indicates that noise controls are needed, EHS shall recommend exploring engineering or administrative solutions. Determining the feasibility of these controls is a collaborative process that assigns specific responsibilities for technological evaluation and financial funding:

1. **Technological Feasibility Evaluation:** EHS will assess initial control options. For complex environments, specialized equipment, or modifications involving building infrastructure, EHS may engage external acoustical consultants or coordinate with TCU Facilities to determine if structural solutions are technological viable.
2. **Financial Responsibility and Funding:** Funding for the implementation of noise controls- including evaluations, equipment modification, or capital projects follows the universities standard ownership model:
 - a. **Specialized/Departmental Equipment:** The employing department or unit is financially responsible for controls applied to equipment required specifically for their operational function (e.g., laboratory centrifuges, groundskeeping machinery, or specific shop tools).
 - b. **Basic Building Infrastructure:** TCU Facilities is typically responsible for funding controls applied to base building systems and general infrastructure (e.g., central HVAC units, primary chillers, or facility-wide ventilation).
 - c. **Complex/Shared Infrastructure (“Grey Areas”):** When an EHS-recommended control involves specialized departmental equipment that integrates directly into base building infrastructure, EHS will facilitate a collaborative review between TCU Facilities and the affected department’s leadership to determine the appropriate funding distribution prior to implementation.
3. **Implementation or Variance:** If deemed feasible, the responsible party shall implement the controls within their operational authority. If it is determined that an EHS-recommended control is not technologically or economically feasible, leadership from the financially responsible department must formally document this justification and submit it to EHS.
4. **Interim Protection:** If controls are deemed infeasible, or while funding and installation are pending, affected employees must remain enrolled in the Hearing Conservation Program and rely on administrative controls and mandatory hearing protection.
5. **Follow-Up Verification:** Departments must notify EHS when controls are finally installed, modified, or removed. EHS shall conduct follow-up monitoring to verify effectiveness, determine whether exposures remain at or above the 85 dBA TWA threshold, and confirm if program enrollment is still necessary.

6. Hearing Protection Devices (HPDs)

The university employing department shall provide hearing protectors at no cost to all employees whose occupational noise exposure equals or exceeds 85 dBA TWA. HPDs are used in conjunction with the University’s monitoring and control measures to protect against noise-induced hearing loss. Devices must be replaced as necessary due to wear, contamination, damage, or loss of effectiveness.

6.1 When Hearing Protectors Are Required

The university shall ensure that appropriate hearing protectors are worn by:

1. All employees exposed to an 8-hour TWA of 85 dBA or more.
2. Employees assigned to posted high-noise areas or designated high-noise tasks under this Program.
3. Employees performing work involving elevated impact or impulse noise, such as firearms use or similar operations.
4. Employees required to wear PPE because feasible engineering or administrative controls do not sufficiently reduce exposure below the 85 dBA TWA limit.

Note: TCU requires all employees entering a designated Caution or Warning space (where noise exposure exceeds 85 dBA) to wear hearing protection, regardless of the duration of exposure.

6.2 Types of Protection

The University primarily utilizes two types of hearing protection. Employees should select the type that best fits their work environment, physical comfort, and required attenuation:

Type of Hearing Protection	Advantages	Disadvantages
Earplugs (Formable or pre-molded)	• Offer higher maximum attenuation (NRR) than most earmuffs. • Highly compatible with safety glasses, helmets, and other PPE without breaking protective seal. • More comfortable for long term wear in hot or humid work environments. • Easily carried, stored, and do not interfere with work in close quarters.	• Require proper insertion techniques and good hand hygiene to ensure an adequate seal. • Fitting can be complicated due to varying ear canal sizes and shapes. • More difficult for supervisors to visually monitor for compliance from a distance.
Earmuffs	• Generally easier to properly fit and put on; one size fits most adults. • Provide more consistent protection and usually last longer than earplugs. • Highly visible at a distance for compliance monitoring. • Can be worn or adjusted easily while wearing work gloves.	• Protection level drops significantly if the seal is broken by safety glasses, long hair, or hats. • Can be bulky, heavy, and uncomfortable in hot locations due to excessive heat and sweat accumulation. • Usually have slightly lower NRR than formable earplugs.

6.3 HPD Selection and Purchasing Requirements

Employing departments and units are responsible for purchasing and providing a variety of suitable hearing protectors for their affected employees at no cost. To ensure safety and compliance, all departmental hearing protection purchases must meet the following criteria:

- **Visible Rating:** The Noise Reduction Rating (NRR) must be clearly labeled on the device packaging.
- **Task-Appropriate Attenuation:** EHS will recommend specific NRR ranged based on the local noise environment. This ensures adequate hearing protection without causing dangerous over-attenuation that compromises situational awareness or communication.

6.4 NRR Derating Protocols and Attenuation

The Noise Reduction Rating (NRR) is a laboratory-derived rating required by the U.S. Environmental Protection Agency (EPA) on hearing protector labels. Because laboratory conditions do not reflect actual field performance, the University uses a conservative derating protocol for A-weighted measurements when estimating real-world attenuation:

- Estimated dBA Exposure = TWA (dBA) – [(NRR – 7) × 0.50]
- **Example:** If an employee is exposed to a TWA of 92 dBA and wears earplugs with an NRR of 33, the estimated protected exposure is 79 dBA.

The University will select hearing protectors that, using this conservative internal method, are intended to reduce employee exposure to 85 dBA TWA or below whenever feasible. This internal target is more protective than OSHA's general minimum attenuation requirement of 90 dBA TWA and supports an added margin of safety in hearing protector selection.

6.5 Double (Dual) Hearing Protection

Dual hearing protection involves wearing two forms of hearing protection simultaneously (e.g., earplugs and earmuffs). Dual hearing protection must be worn where noise levels exceed 115 dBA. Simply adding the NRR levels of each device together does not calculate the total protection. Instead, wearing dual protection adds 5 dB of attenuation to the derated value of the primary protector.

- **Example:** Using the calculation above, if an employee has a derated exposure of 79 dBA with earplugs, adding earmuffs provides an additional 5 dB of reduction, resulting in a final exposure of 74 dBA.

6.6 Hearing Protection Fit Testing

Quantitative fit testing helps an individual decide which type and size of earplug provides the best level of protection and verifies that the device is being worn correctly. Where feasible, EHS provides individual fit testing for earplugs upon request. Fit testing will also be utilized as a mandatory training tool when deemed necessary by EHS, such as in response to an employee experiencing a Standard Threshold Shift (STS).

6.7 Fit, Use, Care, and Re-evaluation

The University shall provide training on the use and care of all provided hearing protectors, ensure proper initial fitting, and supervise correct use. Devices must be inspected prior to each use; any that are damaged, worn, or heavily soiled must be discarded. In-ear hearing protectors shall never be shared.

The adequacy of hearing protector attenuation shall be formally re-evaluated whenever:

- Employee noise exposures increase or job duties/equipment change.
- An employee experiences a Standard Threshold Shift (STS).
- Fit, comfort, or compatibility problems suggest the device is not being worn effectively.

7. Medical Surveillance and STS Follow-Up

7.1 Health Effects of Noise Exposure

Health effects of noise can be divided into two categories: chronic and acute.

- **Chronic Effects:** These are health conditions that require long-term or continuous treatment, such as tinnitus and permanent hearing loss. Tinnitus is characterized by the perception of sound, usually a ringing or buzzing, without the presence of an actual noise source. Permanent hearing loss (Permanent Threshold Shift, or PTS) is irreversible. Although hearing aids can amplify sounds, they cannot lower a person's hearing threshold to the original level.
- **Acute Effects:** Associated with overexposure to noise, these include acoustic trauma and short-term hearing loss. Short-term hearing loss is reversible, though recovery time varies. Acoustic trauma is likely to occur from impulsive, or impact noise (loud, short bursts lasting less than one second) and the effects are likely permanent.

Furthermore, communication issues resulting from hearing impairment may lead to otherwise avoidable safety hazards; employees suffering from hearing loss may not be able to hear alarms, radios, or other forms of hazard communication.

7.2 Coverage Threshold

The University shall maintain a continuing, effective audiometric testing program for all employees whose exposures equal or exceed the 85 dBA TWA action level. All testing, evaluation, and subsequent medical referrals must be provided at no cost to the employee.

7.3 Baseline Audiogram

A valid baseline audiogram must be established within 6 months of an employee's first exposure at or above the action level. Where mobile test vans are used to meet this requirement, the baseline must be obtained within 1 year; however, employees must wear hearing protection for any period exceeding 6 months prior to receiving their baseline test.

7.4 14-Hour Quiet Period Requirement

Baseline testing must be preceded by at least 14 hours without exposure to workplace noise. The University shall formally notify employees of the need to avoid high levels of non-occupational noise during this 14-hour period. If a quiet period cannot be achieved administratively, hearing protectors must be worn continuously during the 14 hours prior to the test to satisfy this requirement.

7.5 Annual Audiogram

Following the establishment of a baseline, yearly audiometric tests shall be conducted. Each annual audiogram shall be compared to the baseline audiogram to determine if the audiogram is valid and if a change in hearing has occurred.

7.6 Qualified Providers and Test Room Requirements

Testing must be performed by a licensed or certified audiologist, otolaryngologist, physician, or a qualified technician operating under professional supervision. Audiometric tests shall be conducted in a room meeting the specific background sound pressure level requirements of 29 CFR§ 1910.95 Appendix D. Furthermore, audiometers must undergo strict acoustic and exhaustive calibration according to OSHA Appendix E.

7.7 Clinical Referral and Abnormal Review

If an annual audiogram reveals an abnormal finding or indicates a medical pathology of the ear that may be caused or aggravated by wearing hearing protectors, the employee will be referred for a clinical audiological or otological evaluation.

7.8 Definition of a Standard Threshold Shift (STS)

A Standard Threshold Shift is defined as a change in hearing threshold relative to the baseline audiogram of an average of 10 decibels (dB) or more at 2000, 3000, and 4000 Hz in either ear. In determining whether an STS has occurred, the University may apply age correction factors to the audiogram as permitted by 29 CFR§ 1910.95 Appendix F.

7.9 Retest Option

If an annual audiogram indicates an STS, the University may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.

7.10 Written Notification Timeline

If an STS has occurred, the University shall formally notify the affected employee in writing within 21 days of the determination.

Note: This complies directly with the 29 CFR§ 1910.95(g)(8)(i) requirement.

7.11 Corrective Action (Refit and Retrain)

Unless a physician determines the STS is not work-related, employees experiencing an STS shall immediately be refitted with appropriate hearing protectors, retrained in their proper use and care, and strictly required to use them. If the employee is already wearing hearing protectors, their PPE will be re-evaluated, and they will be provided with hearing protectors offering greater attenuation.

7.12 Revised Baseline

If an STS is determined to be persistent, or if the hearing threshold has improved significantly over the baseline, the annual audiogram shall be substituted for the baseline audiogram for all future threshold comparisons.

8. Training and Access to Information

8.1 Mandatory Training Elements

Personnel with personal exposure levels equal to or greater than the University exposure limit of an 8-hour TWA of 85 dBA must complete initial training upon assignment. In accordance with 29 CFR§ 1910.95(k)(2), the training program shall be repeated annually for each employee included in the hearing conservation program.

8.2 EHS Hearing Conservation Training

To accommodate various departmental schedules and learning preferences, EHS provides this mandatory training through both an online module (accessible via the EHS website) and instructor-led, in-person sessions. Regardless of the delivery method, the training ensures regulatory compliance by covering the following required topics:

- The effects of noise on hearing (including both occupational and non-occupational exposures).
- General workplace noise controls used to mitigate exposure.
- The purpose, advantages, and attenuation characteristics of various hearing protectors.
- Instructions on the selection, fitting, use, and care of hearing protection.
- The purpose of audiometric testing and an explanation of the test procedures.
- Personnel's right to access records kept by the university under this program.

8.3 Site-Specific Training

While EHS provides the mandatory general hearing conservation training, individual units and departments are responsible for conducting and documenting site-specific hazard training.

- **Timing of Training:** This localized training must be completed prior to an employee's initial assignment to a high-noise task or designated Caution/Warning area, and whenever new equipment or processes introduce new noise hazards.
- **Required Content:** Supervisors must instruct personnel on the specific equipment generating the noise, the local engineering and administrative controls in place (e.g., "Do not bypass the acoustic enclosure on the generator"), the specific hearing protection devices provided in that shop, precisely when and where to wear them, and the protocol for reporting damaged PPE or symptoms of hearing loss.
- **Documentation:** Departments must document this site-specific training. This can be achieved via a signed Job Hazard Analysis (JHA) review sheet, a tailgate safety meeting roster, or a departmental sign-in sheet. These records must be retained by the department and made available to EHS during compliance audits.

8.4 Access to Standards and Materials

A copy of the OSHA Occupational Noise Exposure standard (29 CFR§ 1910.95) must be posted in the workplace or otherwise made readily available to all affected employees and their representatives.

9. Recordkeeping and Compliance Audits

9.1 Record Retention Summary Matrix

Role	Records Maintained	Retention Period
Environmental Health & Safety (EHS)	Official Program records related to occupational exposure (noise surveys, dosimetry results, monitoring notifications, control recommendations, program audits). Training completion records are tracked on the EHS website.	Noise exposure measurement records: 2 years minimum from the date of measurement.
University Units / Departments / Supervisors	Department roster of covered employees, training completion records, local scheduling for audiometric testing, updated JHAs, and local employee hazard communications.	Maintain as part of the permanent department/unit safety and personnel records.
Audiometric Testing Provider	Audiograms, STS determinations, examiner info, audiometer calibration records, and test room background measurements. (Copies provided to TCU/EHS).	Duration of employment plus 30 years.

9.2 Exposure Monitoring Records

EHS shall maintain an accurate record of all noise exposure measurements. These records must be retained for a minimum of 2 years from the date of the measurement.

Furthermore, EHS shall retain copies of all Employee Notification of Results forms (or signed departmental rosters) alongside these measurement records to verify that affected employees were informed of their exposure.

9.3 Audiometric Records Contents

The Audiometric Provider shall maintain all audiometric test records. Per OSHA requirements, these records must include:

1. The name and job classification of the employee.
2. The date of the audiogram and the examiner's name.
3. The date of the last acoustic or exhaustive calibration of the audiometer.
4. The employee's most recent noise exposure assessment.
5. Accurate records of the background sound pressure measurements for the audiometric test room.

Note: Copies of these records will be provided to and maintained by TCU/EHS.

9.4 Retention Periods

Audiometric test records, STS determinations, and related medical files shall be retained for the duration of the affected employee's employment plus thirty (30) years, in strict accordance with university records policy and 29 CFR§ 1910.1020.

9.5 Employee Access to Records

Access to records under this program shall be provided upon request to employees, former employees, and their designated representatives in accordance with the access provisions of 29 CFR§ 1910.95(m)(4).

9.6 Compliance Audits

EHS will conduct a program review every twelve to twenty-four months to evaluate the overall effectiveness of the Hearing Conservation Program. This audit may include spot inspections of high-noise areas, noise data re-sampling, review of PPE condition, and the auditing of departmental training and audiometric testing records.

Appendix A: Definitions

Action Level (AL): Employee noise exposure of 85 dBA as an 8-hour time-weighted average (TWA) that triggers OSHA hearing conservation program requirements.

Attenuation: The estimated or actual reduction in the noise level reaching the eardrum, typically provided by the use of engineering controls or hearing protection devices.

Audiogram: A chart or record showing a person's hearing threshold levels by frequency.

Audiologist: A licensed or certified hearing professional. Under OSHA, audiometric tests may be performed by a licensed or certified audiologist, otolaryngologist, other physician, or a qualified technician working under professional supervision.

Audiometer: An instrument used to measure hearing thresholds.

Audiometric Testing: Pure-tone air-conduction hearing threshold testing used to establish a baseline and compare later results for possible hearing changes.

Baseline Audiogram: The initial audiogram used as the reference for comparison with subsequent annual audiograms.

Decibel (dB): A logarithmic unit used to express sound level.

A-Weighted Decibel (dBA): A sound level measured using the A-weighting scale, which approximates the sensitivity of human hearing and is used for most occupational noise measurements.

Hearing Protector / Hearing Protection Device (HPD): Personal protective equipment worn in or over the ears to reduce sound reaching the ear.

Hearing Threshold Level (HTL): The lowest sound level a person can hear at a specified frequency during audiometric testing.

Impact or Impulse Noise: Loud, short bursts of noise lasting less than one second. The ceiling limit for impulse noise is 140 dB.

Job Hazard Analysis (JHA): A safety management tool used to identify and mitigate hazards associated with specific job tasks.

Noise Dose: The percentage of a worker's allowable daily noise exposure accumulated during a work shift. A dose of 100% means the daily allowable exposure has been reached or exceeded.

Noise Reduction Rating (NRR): The laboratory-derived numerical rating shown on hearing protector packaging to indicate potential noise attenuation.

Otolaryngologist: A physician specializing in disorders of the ear, nose, and throat.

Permissible Exposure Limit (PEL): OSHA's legal general industry exposure limit for noise: 90 dBA as an 8-hour TWA, using a 5 dB exchange rate.

Time-Weighted Average (TWA): Average noise exposure over an 8-hour workday. Under OSHA Appendix A, TWA may be calculated from dose using $TWA = 16.61 \log_{10}(D/100) + 90$.

Appendix B: Signage Example

Signage must be posted in areas where noise level routinely equal or exceed 85 dBA. The signs must be clearly visible and contain the following information:

Post the **NOTICE** sign at the entrance to areas where noise exposure may exceed 85 dBA TWA₈.



Post the **CAUTION** sign near equipment that generates noise at or exceeding 85 dBA.

Post the **WARNING** sign in areas where noise exceeds 115 dBA, even intermittently.



Appendix C: OSHA Table G-16 (Permissible Noise Exposures)**Figure 1. Table G-16 Permissible Noise Exposures**

Duration per day, hours	Sound Level dBA slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

Figure 1. [Title of graph]. Adapted from OSHA, “1910.95 – Occupational noise exposure,” U.S. Department of Labor, accessed March 26, 2026.