UC RIVERSIDE | Environmental Health & Safety

Hearing Conservation Program

Responsible Program Administrator: Industrial Hygiene

Reviewed: May 2025

Summary: This section describes the policies and procedures of the Hearing Conservation Program, which is managed by Environmental Health and Safety (EH&S) at UC Riverside.

1. Program Description

The University of California, Riverside (UC Riverside) Hearing Conservation Program (HCP) is designed to prevent permanent noise-induced hearing loss caused by occupational noise exposure. In accordance with California Occupational Safety and Health Administration (Cal/OSHA) regulations, employers must protect all employees, researchers, students, and volunteers involved in UC Riverside-related activities from the harmful effects of excessive noise.

Cal/OSHA requires protective measures when workplace noise levels exceed a time-weighted average (TWA) of 90 decibels (dBA) over an 8-hour period—known as the Permissible Exposure Limit (PEL). These measures should be implemented through engineering or administrative controls. If such controls are insufficient to reduce noise to acceptable levels, appropriate personal protective equipment (PPE) must be provided and used.

Furthermore, when employee noise exposures reach or exceed an 8-hour TWA of 85 dBA—referred to as the Action Level (AL)—the employer is required to establish and maintain a comprehensive Hearing Conservation Program. This program has been developed to ensure compliance with Cal/OSHA's Hearing Conservation requirements as outlined in California Code of Regulations, Title 8, Section 5097.

2. Scope

2.1 This HCP applies to all UC Riverside employees, researchers, students, and volunteers engaged in UC Riverside-related activities who are routinely exposed to noise levels at or above the Cal/OSHA Action Level of 85 decibels as an eight-hour time-weighted average. The program is designed to protect individuals from

the harmful effects of excessive occupational noise exposure.

2.2 Departments or job functions that may be at risk of exposure to elevated noise levels include, but are not limited to, the following:

- Agricultural Operations involving machinery
- Auxiliary Facilities Services
- Carpentry Shop
- Central Plant Operations
- Data Center Operations Dept
- Department of Music
- Department of Performing Arts
- Facilities Services
- Fleet Services
- Groundskeeping
- Housing Facilities Services
- HUB Facilities Maintenance Dept
- Machine Shop
- Maintenance Services
- Misc Core Facilities
- Network Operations Dept
- Theater, Film, and Digital Production Department
- UC Riverside Police Department
- Vivarium Areas

2.3 UC Riverside's Hearing Conservation Program includes:

- Noise assessment and exposure monitoring
- Audiometric Testing
- Hearing protection
- Employee education and training
- Record keeping

3. Definitions

Action Level: The action level for noise exposure is 85 A-weighted decibels (dBA) or greater, averaged over an eight-hour work period. When this threshold is reached, the following requirements apply to all employees, researchers, students, and volunteers under Cal/OSHA regulations.

Administrative Controls: Administrative controls are strategies used to reduce noise exposure for employees, researchers, students, and volunteers by managing the duration and scheduling of tasks in high-noise areas. These controls aim to keep individual exposure levels below the Cal/OSHA AL of 85 dBA (8-hour TWA).

Audiometric Testing: Audiometric testing, as required by Cal/OSHA Title 8, Section 5097, measures the sensitivity of a person's hearing threshold in decibels. It is a critical component of the HCP, helping to detect early signs of hearing loss and prevent further damage.

Audiometer: An instrument of measuring the threshold or sensitivity of hearing.

Audiologist: A licensed healthcare professional specializing in the prevention, diagnosis, and treatment of hearing and balance disorders. Audiologists typically hold a doctoral degree (Au. D. or equivalent) and may be certified by professional organizations such as the American Speech-Language-Hearing Association (ASHA) or the American Board of Audiology (ABA).

Under Cal/OSHA regulations (Title 8, Section 5097), audiologists are recognized as qualified professionals to conduct and supervise audiometric testing as part of a Hearing Conservation Program. They must be licensed by the state or certified by ASHA and may oversee audiometric technicians certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC).

A-Weighted (dBA): A weighting is a frequency adjustment used in sound level measurements to reflect the sensitivity of the human ear. Expressed as dBA, it filters out low-frequency sounds that are less harmful to hearing and emphasizes the mid to high frequencies, which pose a greater risk. This scale is used in most occupational noise assessments to evaluate potential hearing damage.

Baseline Audiogram: The reference audiogram recorded at the time of enrollment in the Hearing Conservation Program is used for comparison with all future audiograms to detect hearing changes.

Continuous Noise: A steady or fluctuating sound that remains relatively constant in intensity, with variations occurring at intervals of one second or less. This type of noise is typical in many occupational environments—such as factories, workshops, or mechanical rooms—and is distinct from intermittent or impulsive noise. Continuous noise is commonly assessed during workplace noise evaluations due to its sustained potential to contribute to hearing loss over time.

C-Weighted: C-weighting is a sound measurement scale that includes both high and low frequencies, providing a flatter frequency response compared to A-weighting. Expressed as **dBC**, it is commonly used to evaluate impact or impulsive noise and to assist in the selection of appropriate hearing protection devices.

Decibels (dB): A measure of the sound level (loudness). The decibel scale is a logarithmic scale; as an example, a 90 dB noise is ten times louder than an 80 dB noise.

Engineering Controls: Engineering controls are the preferred method for reducing noise exposure, as they address the hazard directly at its source. These controls should be implemented before considering administrative or personal protective measures, whenever feasible. The goal is to eliminate or minimize exposure by redesigning the work environment or modifying equipment and processes.

Frequency: A sound pitch measured in hertz (Hz); high pitches are high

frequency sounds.

Hearing Conservation Program (HCP): Program established when employees are exposed to noise exceeding the AL. The program shall include noise surveys, audiometric testing, hearing protectors, training and record keeping requirements.

Hearing Protection Devices (HPD's): Personal protective equipment that is designed to be worn in the ear canal or over the ear to reduce the sound level reaching the ear drum. Examples include earmuffs or plugs.

Hearing Threshold Level (HTL): The lowest threshold that the employee can hear the test tone during an audiometric test. The HTL's are recorded on the employee's audiogram.

Hertz (Hz): A unit of measurement of frequency, expressed as cycles per second.

Impulse/Impact Noise: Noise is a sharp burst of sound, generally of less than one-half second in duration and does not repeat itself more than once per second.

Noise: Unwanted sound.

Noise Dosimeter: A noise dosimeter is a personal monitoring device worn by an individual to continuously measure and record sound exposure throughout a work shift. It integrates sound levels over time to calculate the Time-Weighted Average (TWA) noise exposure, helping determine whether an employee's exposure exceeds regulatory limits.

Noise Reduction Rating (NRR): The Noise Reduction Rating of hearing protection devices (HPD) indicates the theoretical amount of reduction of noise levels that can be achieved if the HPD is worn correctly. This rating is shown on the HPD packaging.

Noise-induced hearing loss: Slow but progressive inner-ear hearing loss resulting from exposure to continuous noise over a long period of time, as opposed to acoustic trauma or physical injury to the ear.

Normal hearing threshold: Auditory acuity equal to or less than 25 dB in all frequencies.

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

Permissible Exposure Limit (PEL): The PEL for occupational noise exposure is 90 A-weighted decibels (dBA) averaged over an 8-hour time-weighted average (TWA), as established by Cal/OSHA. This means that employees, researchers, students, and volunteers may be exposed to noise levels of up to 90 dBA over a

standard work shift without a significant risk of serious hearing damage, provided proper protective measures are in place. Exposures exceeding this limit require immediate implementation of noise control strategies and hearing protection.

Pitch: Another term for sound frequency. Higher pitches are higher frequency sounds.

Representative Exposure: A measurement of an individual's noise dose or 8-hour time-weighted average sound level that accurately reflects the typical noise exposure of employees, researchers, students, and volunteers performing similar tasks or working in comparable environments. These measurements are used to assess group exposure levels when it is not feasible to monitor every individual directly.

Sound: A vibration or pressure oscillation that is detectable by the eardrum.

Sound Level Meter: An instrument used to measure sound pressure levels in decibels (dB) during area noise monitoring. It provides real-time readings of ambient noise levels and is commonly used to assess workplace environments for compliance with occupational noise standards.

Speech Interference Levels (SILs): The frequencies most associated with speech, which are the 500-4000 Hz (frequency) range. Vowels (a, e, i, o, u) are low frequency sounds (below 2000 Hz) and consonants (b, c, d, etc.) are high frequency sounds. The low frequencies are the least affected by noise. If the high frequencies are affected, t's and p's or s's and f's may be easily confused.

Standard Threshold Shift (STS): A Standard Threshold Shift is defined by Cal/OSHA (Title 8, Section 5097) as an average change in hearing threshold of 10 decibels (dB) or more at the 2000, 3000, and 4000 Hz frequencies in either ear, when compared to the individual's baseline audiogram. These frequencies are critical for understanding speech and are particularly vulnerable to damage from occupational noise exposure.

When an STS is identified:

- The employer must notify the affected employee, researcher, student, or volunteer within 21 days.
- A follow-up audiogram must be conducted to determine whether the shift is persistent.
- Hearing protectors must be evaluated or refitted, and retraining provided if necessary.
- In some cases, the baseline audiogram may be revised in accordance with regulatory criteria.

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.

Threshold of Pain: A noise level of 120 dB causes pain.

Weighting Filters, Scales or Networks: Sound level meters and dosimeters use a

selective weighting system (filters) to eliminate certain frequencies from the measurements that are unimportant in noise exposure.

4. Responsibilities

4.1 Department Heads, Chairs, and Directors

Department Heads, Chairs, and Directors are responsible for the following health and safety obligations within their respective units:

- Ensuring that adequate resources are allocated to maintain the health and safety of all employees, researchers, students, and volunteers.
- Designating supervisors and verifying that they receive appropriate training on their health and safety responsibilities.
- Enforcing departmental compliance with all applicable campus health and safety policies, procedures, and regulatory requirements.
- Overseeing the identification and control of workplace hazards and supporting the implementation of corrective actions when necessary.

4.2 Faculty, Managers, Principal Investigators, Staff, and Supervisors

Faculty, Managers, Principal Investigators, Staff, and Supervisors are responsible for ensuring compliance with the Hearing Conservation Program and for protecting the hearing health of all individuals under their supervision, including employees, researchers, students, volunteers, visitors, and guests. Their responsibilities include:

- Ensuring all personnel understand and comply with the requirements of the HCP.
- Identifying operations or tasks that generate hazardous noise and implementing feasible engineering or administrative controls to reduce exposure.
- Requesting evaluations from the EH&S IH Division for operations with potentially hazardous noise levels that cannot be effectively controlled.
- Providing appropriate hearing protection devices (HPDs) and enforcing their consistent and proper use in designated high-noise areas or tasks.
- Posting clear and visible signage in areas where hearing protection is required.
- Ensuring that individuals exposed to noise levels at or above the action level (85 dBA TWA) are properly enrolled in the HCP, including:
    - Promptly enrolling new employees assigned to noisy environments.
    - Confirming that all enrolled individuals complete required annual hearing conservation training.
    - Coordinating with Occupational Health to ensure that individuals who experience an STS or other audiometric abnormality receive a follow-up exam within 30 days, as required by Cal/OSHA.
    - Recommending an exit audiometric exam at the time of an employee’s relocation, resignation, or termination, and notifying the

Occupational Health accordingly.

- Enforcing adherence to noise reduction procedures and HPD use in all relevant areas and assignments.
- Posting a copy of the Occupational Noise Regulation (CCR Title 8, Sections 5096–5100, Article 105) in an accessible location within the department.
- Maintaining HPDs in a sanitary condition and proper working order.
- Promptly notify the EH&S IH Division of any noise complaints, potential hazards, or observed hazardous conditions. All concerns should also be reported through the official EH&S reporting link: **Report an Incident or Safety Concern** for timely assessment and corrective action.

4.3 Employees, Students, and Volunteers

All employees, students, and volunteers have a shared responsibility in maintaining a safe and healthy-compliant work and study environment. Those exposed to occupational noise levels at or above the Action Level (85 dBA TWA) must comply with the following:

General Responsibilities:

- Understand and comply with campus health and safety policies, including those specific to hearing conservation.
- Complete all required training, including annual hearing conservation training (via live sessions or the Learning Management System).
- Attend baseline and annual audiometric testing appointments. If a Standard Threshold Shift (STS) or other audiometric abnormality is detected, complete a follow-up exam within 30 days as required by Cal/OSHA.
- Report hazardous noise conditions, malfunctioning hearing protection, or safety concerns promptly to supervisors or EH&S using the official Report an Incident or Safety Concern link.
- Cooperate with all noise exposure monitoring or air sampling activities conducted by EH&S or its representatives.

Hearing Protection Responsibilities:

- Wear approved HPDs when required (e.g., in areas exceeding 85 dBA or after experiencing an STS).
- Maintain HPDs in clean and proper working conditions.
- Notify supervisors or EH&S immediately if HPDs are damaged, lost, or ineffective.
- Participate in HPD fitting and training provided by EH&S.

Audiometric Testing Participation:

- Avoid high levels of non-occupational noise for at least 14 hours prior to audiometric exams (may be met by wearing HPDs that reduce exposure to ≤80 dBA).
- Follow through with medical referrals or additional evaluations if recommended after audiometric review.
- Undergo exit audiometric exams upon relocation, resignation, or termination from positions with hazardous noise exposure, to document hearing status.

4.4 Environmental Health and Safety (EH&S)

The UC Riverside Hearing Conservation Program is administered by EH&S. EH&S serves as a technical resource to campus departments and supports them in fulfilling their responsibilities under the program. Specifically, EH&S is responsible for:

Program Oversight:

- Develop, implement, and maintain the UCR Hearing Conservation Program.
- Ensure the program meets all regulatory requirements and institutional standards.

Noise Monitoring and Evaluation:

- Conduct workplace and employee noise assessments upon request or as needed.
- Determine whether administrative or engineering controls are required and assist in planning their implementation.
- Identify areas, job classifications, or processes that require noise abatement, signage, or inclusion in the Hearing Conservation Program.
- Evaluate and periodically re-evaluate employee noise exposures by job title to determine HCP eligibility.

Control Recommendations and Support:

- Recommend feasible engineering and administrative controls to reduce noise exposure.
- Assist employees in the selection, fitting, and proper use of HPDs.
- Provide guidance on maintaining HPDs in good working conditions.

Training and Education:

- Deliver required annual hearing conservation training to employees, researchers, students, and volunteers, either through hands-on sessions or the Learning Management System (LMS), as appropriate.
- Coordinate supplemental training in collaboration with the Occupational Health and Examinetics when needed, including in response to a Standard Threshold Shift detected during an audiogram or a recordable threshold shift that has been confirmed.

Recordkeeping:

- Maintain accurate records of employee noise exposure measurements and related evaluations.
- Ensure documentation aligns with Cal/OSHA requirements and university policy.

4.5 Occupational Health

Occupational Health plays a critical role in supporting the Hearing Conservation Program by overseeing medical surveillance and ensuring compliance with applicable health regulations. Key responsibilities include:

- Coordinating audiometric testing for all enrolled employees, researchers, students, and volunteers, including baseline, annual, and post-employment (exit) exams.

  Types of Audiometric Exams:
  - Baseline Exam: Conducted prior to assignment in high-noise areas (≥85 dBA). Must follow at least 14 hours without workplace noise exposure (or use of hearing protection).
  - Annual Exam: Conducted every 12 months to identify any shifts in hearing thresholds.
  - Follow-Up Exam: Required within 30 days if an STS or abnormality is detected, to confirm hearing changes.
  - Exit Exam: Recommended at the time of relocation, resignation, or termination to document final hearing status.

- Preparing medical packets and scheduling appointments for audiometric exams, either through on-campus events or designated occupational health clinics in the region or outside vendor.

- Conducting audiogram evaluations and maintaining complete, accurate, and confidential records in compliance with regulatory standards.

- Communicating identified STS to the affected individual, their supervisor, EH&S, appropriate Human Resources Business Partners / Department HR Contacts and Workers' Compensation, when reportable under Title 8 CCR §14300.10.

- Providing educational support and training on noise hazards and hearing conservation in partnership with EH&S and training vendors.

- Work with outside clinics or vendors to coordinate appropriate HPDs and ensure proper fitting and selection for individuals, in coordination with the IH Division.

- Implementing work restrictions, if medically indicated, to prevent further hearing loss or aggravation of existing conditions.

5. Program Components

5.1 Noise Exposure Assessments

UC Riverside EH&S is responsible for conducting representative noise

exposure assessments to ensure compliance with Cal/OSHA regulations and support effective implementation of the HCP. These assessments help identify individuals who require enrollment in the HCP and ensure proper selection and use of hearing protection.

Representative Noise Monitoring

- EH&S conducts representative noise monitoring using a designed sampling strategy to evaluate Similarly Exposed Groups (SEGs) across campus operations.

- Assessments include continuous, intermittent, and impulsive sound levels ranging from 80 to 130 dBA, integrated into the final exposure calculation.

- Noise exposure is measured as an 8-hour TWA or as a dose percentage of the PEL.

- Per Cal/OSHA:
  - An 8-hour TWA of 85 dBA or a 50% dose triggers inclusion in the HCP.
  - A TWA of 90 dBA or more exceeds the PEL and requires immediate protective measures.

- Monitoring must be repeated whenever changes occur in production, equipment, processes, or noise controls that could:

  - Invalidate current hearing protection; or
  - Results in new or additional personnel exceeding the action level.

Employee Notification

- EH&S will provide written notification to all employees, researchers, students, and volunteers—along with their supervisors, including Faculty, Managers, Principal Investigators, and Staff—if their noise exposure meets or exceeds the 85 dBA action level.
- All affected individuals will receive individualized exposure monitoring results.
- Employees or their authorized representatives may request to observe the noise monitoring by coordinating with EH&S in advance.

Requesting Monitoring

Employees and supervisors are encouraged to contact EH&S to schedule noise monitoring if:

- They suspect noise exposures may exceed safe limits.
- Equipment or process modifications have altered noise levels.
- Current hearing protection appears inadequate for the noise environment.

<u>Types of Noise Assessments</u>

Preliminary Noise Assessments

- A walkthrough survey using a sound level meter to quickly assess noise levels across various areas of a facility.
- Measurements are taken at approximate ear level near workstations, and recorded using facility maps or grid layouts for easy reference.
- This assessment helps identify:
    - Locations with potentially hazardous noise exposure.
    - Variability due to shift changes, equipment cycling, or operational conditions.
    - Areas exceeding 90 dBA, which require mandatory hearing protection.
- If action levels are likely to be exceeded, EH&S will initiate individual exposure monitoring.

Exposure Monitoring

- EH&S performs personal or area noise dosimetry to accurately assess exposure for faculty, staff, and students, potentially exceeding the 85 dBA action level.
- Noise dosimeters are used to measure and document exposure throughout a typical work shift.
- All monitoring data are recorded, which includes:
    - Employee name, ID, and job title.
    - Date, location, and duration of monitoring.
    - Equipment type, calibration data, and results.
- Results are reviewed to:
    - Confirm inclusion in the Hearing Conservation Program.
    - Determine the type and rating of hearing protection needed.
    - Document compliance with Cal/OSHA regulations.

5.2 Audiometric Testing

Audiometric testing is a critical element of UC Riverside's Hearing Conservation Program. It is administered by UCR Occupational Health in coordination with EH&S and approved external vendors to ensure compliance with regulatory standards and protect hearing health.

Program Management

- The audiometric testing program is administered and coordinated by UCR Occupational Health.
- Testing is conducted at no cost to all employees, researchers, students, and volunteers whose exposure meets or exceeds the Cal/OSHA Action Level of 85

dBA TWA.

- UCR utilizes an outside vendor during their annual onsite event each December, which includes hearing tests, conservation training, and counseling.
- The Audiometric Test, Train, and Counsel (TTC) service includes:
    - Baseline and annual hearing tests.
    - Employee notification and counseling.
    - Otoscopic exams (if applicable).
    - Training in hearing protection.
    - Management reports summarizing results, trends, and potential Cal/Osha recordable shifts.

- Throughout the year, UCR also works with a local occupational health clinic to ensure continued access to audiometric testing for individuals who:
    - Miss the annual event or need a follow up
    - Are exiting employment and require a final audiogram to document their hearing status at the time of departure or relocation to a different position.
    - Need a baseline audiogram as part of enrollment into the HCP.
    - All testing records from local clinic visits are forwarded to our outside vendor to maintain a complete, centralized audiometric record for each participant.

Audiometric Testing Standards and Personnel

- Audiometric tests must be performed by a:
    - Licensed or certified audiologist, otolaryngologist, or physician, or
    - Certified technician (e.g., CAOHC-certified) under the supervision of a licensed provider.
- Technicians operating microprocessor audiometers are not required to be certified but must work under the direction of a qualified professional.

Baseline Audiograms

- Baseline audiograms are required for all individuals whose job classification is included in the Hearing Conservation Program.
- Baseline tests must be conducted:
    - Upon initial assignment to a noise-hazardous job, and
    - Preceded by at least 14 hours without workplace noise exposure. This requirement may be met by wearing properly fitted hearing protectors that reduce exposure to 80 dBA or lower.

Annual Testing and Reassessment

- Individuals enrolled in the Hearing Conservation Program must receive audiometric testing annually after the baseline is established.
- All tests and evaluations must comply with CCR Title 8, Section 5097(d). Audiometric Data Analysis
- Audiometric Database Analysis (ADBA) is conducted by our outside vendor or third-party occupational health clinic, using methodologies outlined in ANSI Standard S12.13-1991.
- This analysis helps assess the effectiveness of the hearing conservation efforts and detect early patterns of hearing loss.

Notification and Follow-up

- Employees shall receive written notification within 21 days if their audiogram indicates an STS that is determined to be work-related.
- Appropriate follow-up may include:
    - Re-testing to confirm results.
    - Evaluation of hearing protection adequacy.
    - Hearing conservation retraining.
      Referral to a licensed medical provider for further evaluation, if warranted.

Exit Audiometric Exam:

An Exit Audiometric Exam is strongly recommended at the time of an individual's resignation, relocation, or termination. This final audiogram**:**

- Documents the individual's hearing status upon departure from the HCP.
- Serves as part of a comprehensive reassessment of the individual's cumulative occupational noise exposure.
- Allows comparison to baseline and annual audiograms to identify any long-term changes or trends in hearing thresholds.
- May be used to inform future occupational health decisions or support potential workers' compensation evaluations if hearing loss becomes a concern after employment ends**.**

Corrective Actions Following an STS Significant Threshold Shifts in accordance with Cal/OSHA Title 8, Section 5097.

When an STS is confirmed and determined to be work-related or aggravated by occupational noise exposure, UC Riverside will take the following corrective actions in collaboration with the IH, Occupational Health, and relevant departments to protect the individual's hearing and maintain regulatory compliance:

- A follow-up audiogram shall be conducted within 30 days of the initial test to confirm the threshold shift.
- If the comparison between the annual audiogram and baseline audiogram indicates a confirmed STS, the affected individual shall be notified in writing within 21 days of the determination.
- If a licensed physician or audiologist determines that the STS is work-related or aggravated by occupational noise exposure, the following actions shall be taken:

1. **For Individuals Not Previously Using Hearing Protection:**

   IH will work directly with the affected individual to:
    - Provide and properly fit appropriate HPDs.
    - Deliver training on the correct use, care, and maintenance of HPDs;
    - Enforce mandatory use of HPDs in designated high-noise areas.

2. **For Individuals Already Using Hearing Protection:**
    - Reassess and refit current HPDs to ensure proper fit and performance.
    - Provide refresher training in usage and maintenance.
    - Supply HPDs with greater attenuation if existing protection is inadequate.

3. **Noise Exposure Reassessment:**
    - IH will conduct updated exposure monitoring to evaluate whether changes to equipment, processes, or controls are needed to reduce noise exposure at the source.

4. **Referral for Medical Evaluation:**
    - Refer the individual for a clinical audiological or otological examination if further testing is warranted or if HPDs may be contributing to a medical issue.
    - If a non-occupational ear condition is suspected, inform the individual of the need for external medical follow-up.

5. **Communication of Audiometric Results:**
    - Occupational Health will promptly and confidentially communicate abnormal audiometric findings to the affected individual, their supervisor, and, when applicable, to Workers' Compensation in accordance with Title 8 CCR §14300.10 reporting requirements.

6. **Work Restrictions (if applicable):**
    - The need for work restrictions is determined through a collaborative process involving the employee, their supervisor or department management, Occupational Health, Industrial Hygiene (IH), Workers' Compensation, and the appropriate Human Resources Business Partner or Department HR Contact. This interactive process is designed to evaluate and implement suitable workplace accommodations in response to disability-related or medical concerns, including hearing loss.

    - When medically indicated, temporary or permanent work restrictions may be established to prevent further hearing damage and limit exposure to hazardous noise. These decisions are based on the individual's job-related exposure risk and the recommendations of licensed medical professionals. All actions are coordinated through the interactive process to ensure alignment with applicable workplace accommodation laws and UC Riverside policies, while supporting the employee's health and ability to perform essential job functions safely.

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5.3 Noise Reduction and Controls

Excessive noise shall be reduced or eliminated whenever possible. This shall include the implementation of engineering and/or administrative controls, when feasible. When engineering and administrative controls are not feasible, or during the evaluation and implementation of such controls, hearing protective equipment shall be used to protect employees as needed from excessive noise exposure.

Engineering Controls
Engineering control mechanisms or design modifications that reduce noise exposure at the source—should be the primary strategy for controlling high

noise levels, as they offer a long-term or permanent solution. Prior to implementing any controls, a qualified specialist with expertise in acoustics and proper measurement equipment should perform a thorough assessment.

- Departments must ensure that all equipment is regularly maintained, and when replacement is necessary, quieter alternatives should be prioritized during procurement.
- All assessments, decisions, and corrective actions related to engineering controls must be documented and submitted to HCP or IH division for recordkeeping.
- Following the implementation of any engineering controls, updated area noise monitoring must be conducted to evaluate their effectiveness and verify compliance with noise exposure standards.
- As noise levels decrease with distance, noise-generating equipment should be placed away from the majority of employees wherever practical.

Administrative Controls

Administrative controls do not reduce or eliminate the hazard they simply reduce employee exposure to the hazard. Administrative controls may include:

- Rotation of employees to limit individual exposure times
- Flexible machinery operation schedules to limit exposures
- Work task arrangements that reduce the time an employee must spend in a noisy area

5.4 Hearing Protection – Personal Protective Equipment (PPE)

Departments shall provide HPDs at no cost to all employees, researchers, students, and volunteers whose noise exposure equals or exceeds the AL of 85 dBA TWA. Hearing protectors must be immediately replaced if they become broken, defective, or unsanitary.

EH&S is available to assist departments with:

- Determining the appropriate type(s) of hearing protection for specific tasks or noise environments.
- Providing training on the correct use, fitting, and care of HPDs upon request.
- EH&S to supply standard ear plug hearing protection to departments upon request.
    - Note: Any hearing protection that is required above the standard level of PPE will be the department's responsibility.

Use of Hearing Protection

The use of hearing protection is mandatory under the following conditions:

- For all personnel exposed to an 8-hour TWA of 90 dBA or greater.
- For individuals exposed at or above 85 dBA TWA who:
    - Have experienced documented STS.
    - Have not yet completed a baseline audiogram.
- In all areas posted or otherwise designated as requiring hearing protection.

- During operations where ambient noise levels meet or exceed 90 dBA. Faculty, Managers, Principal Investigators, Staff, and Supervisors are responsible for ensuring compliance with these requirements.

Selection and Fitting of Hearing Protection

- Employees, researchers, students, and volunteers must be given the opportunity to select HPDs from a variety of suitable and approved options.
- Proper initial fitting and ongoing supervision shall be provided to ensure that hearing protectors are worn correctly and consistently.
- For an individual who have experienced STS, protectors must reduce exposure to 85 dBA TWA or below.

Hearing Protection Attenuation

The effectiveness of a hearing protector is measured by its NRR. However, actual protection depends on proper fit and use. The following method shall be used to estimate real-world attenuation:

1. Obtain the employee's A-weighted TWA exposure.
2. Subtract 7 dB from the NRR.
3. Subtract the result from the A-weighted TWA to estimate the effective noise level under the hearing protector.

Hearing protectors must:

- Attenuate employee exposure to an 8-hour TWA of 85 dBA or less.
- Be evaluated for adequacy in the specific noise environment in which they are used.
- Be re-evaluated whenever workplace noise levels increase in a way that could render existing HPDs inadequate.

Acceptable methods for measuring HPD attenuation must align with CCR Title 8, Section 5100, Appendix E.

Signage Requirements:

All workplaces where noise levels exceed 85 dBA must have visible signage posted indicating the requirement for hearing protection. Signs must clearly state: "Hearing Protectors Required."

EH&S is available to assist with evaluating areas that may require signage and to coordinate proper installation. See example in Appendix D.

5.5 Education and Training

Training Overview

UC Riverside requires all employees, researchers, students, and volunteers enrolled in the HCP to complete annual hearing conservation training in accordance with Cal/OSHA Title 8, Article 105, Sections 5096–5099.

Training can be found in the online course Hearing Conservation 2.0 – CAL/OSHA. EH&S will deliver training on proper use of individual hearing protection devices and may be tailored to address the specific needs of individual work groups or job classifications. Information about the program is made available through the UCR EH&S website, new employee orientation, safety meetings, and department-level instruction.

Training Frequency

- Initial training is required upon enrollment into the HCP.
- Refresher training must be completed annually for all individuals exposed to an 8-hour TWA of 85 dBA or higher.

Training Content

All training shall include the following topics:

- The effects of noise on hearing and the risk of permanent hearing loss.
- The purpose, types, advantages, and limitations of HPDs.
- Proper selection, fitting, use, and care of HPDs.
- The purpose and procedures of audiometric testing.
- Identification of areas and tasks where hearing protection is required
- A summary of the requirements of UCR's HCP

Training Access and Resources

Copies of the Cal/OSHA occupational noise regulations (CCR Title 8, Sections 5096–5100) shall be:

- Posted in relevant workplaces.
- Made available to all affected employees and their representatives.
- Any informational materials provided by Cal/OSHA or OSHA will also be made accessible to affected employees.

Recordkeeping

- Training records must be maintained by both the employee's department and EH&S, in accordance with Section VII (Recordkeeping Requirements) of this program.

5.6 Recordkeeping Requirements

Effective January 1, 2003, employers are required to record work-related hearing loss cases when an employee's audiometric test reveals a significant decline in hearing ability. A recordable case occurs when:

- There is an STS of 10 decibels or more in either ear at the frequencies of 2000,

3000, and 4000 Hz from the employee's baseline audiogram, and
- The employee's overall hearing level reaches an average of 25 dB or more across the same frequencies in the affected ear(s).

In compliance with Cal/OSHA and OSHA standards, the following recordkeeping practices shall be followed at UC Riverside:

Noise Exposure Records
- All noise exposure measurement records shall be maintained by EHS& for a minimum of two years.

Audiometric Test Records
- Audiometric testing records for individuals enrolled in the Hearing Conservation Program shall be retained by Occupational Health through the approved vendor secured database.
- These records shall include:
    - The employee's name and job classification.
    - The date of the audiogram.
    - The name of the audiometric technician or examiner.
    - The employee's most recent noise exposure assessment.
    - The data of the most recent audiometer calibration and background sound pressure measurements in the test environment.

Retention Period
- Audiometric records shall be retained for the duration of the affected employee's employment.

6. Reporting Requirements

6.1 Effective January 1, 2003, employers are required to record work-related hearing loss cases when an employee's hearing test indicates a marked decrease in overall hearing. The new rule requires recording a 10 decibel or greater shift at 2000, 3000, and 4000 hertz in one or both ears from the employee's initial hearing test and also when they result in an overall hearing level loss of 25 decibels.

7. References

Appendix A - Noise Exposure Computation

Appendix B - Methods for Estimating the Adequacy of Hearing Protection

Appendix C - Flow Decision Chart

Appendix D - Signage

Appendix E - Enrollment Checklist

8. Regulatory and Industry Standards

State Regulations (California):

- Title 8, Section 5097 – Hearing Conservation Program
  California Code of Regulations, administered by the California Department of Industrial Relations.
- Title 8, Sections 5096–5100 – Control of Noise Exposure
  Full Article 105, covering permissible noise exposure, hearing conservation, and related requirements.

Federal Regulations (OSHA):

- 29 CFR 1910.95 – Occupational Noise Exposure
  OSHA's comprehensive federal standard for occupational noise exposure, hearing protection, and monitoring requirements.

American National Standards Institute (ANSI):

- ANSI S1.11-1971 – *Specification for Octave, Half-Octave, and Third-Octave Band Filter Sets*
- ANSI S1.25-1978 – *Specification for Personal Noise Dosimeters*
- ANSI S1.4-1971 – *Specification for Sound Level Meters*
- ANSI S3.6-1969 – *Specifications for Audiometers*

Appendix A: Noise Exposure Computation

https://www.dir.ca.gov/title8/sb7g15a105apa.html

Noise Exposure Computation

I. Computation of Employee Noise Exposure
(a) Noise dose is computed using Table A-1 as follows: When the sound level, L, is constant over the entire work shift, the noise dose, D, in percent, is given by: D = 100 C/T where C is the total length of the work day, in hours, and T is the reference duration corresponding to the measured sound level, L, as given in Table A-1 or by the formula shown as a footnote to that table.
(b) When the workshift noise exposure is composed of two or more periods of noise at different levels, the total noise dose over the work day is given by: $D = 100 (C_1/T_1 + C_2/T_2 + ... + C_n/T_n)$, where Cn indicates the total time of exposure at a specific noise level, and Tn indicates the reference duration for that level as given by Table A-1.
(c) The eight-hour time-weighted average sound level (TWA), in decibels, may be computed from the dose, in percent, by means of the formula: $TWA = 16.61 \log_{10} (D/100) + 90$. For an eight-hour workshift with the noise level constant over the entire shift, the TWA is equal to the measured sound level.
(d) A table relating dose and TWA is given in Section II.

Table A-1

A-weighted sound level, L (decibel)	Reference Duration T (hour)	A-weighted sound level, L (decibel)	Reference Duration T (hour)
80	32	106	0.87
81	27.9	107	0.76
82	24.3	108	0.66
83	21.1	109	0.57
84	18.4	110	0.5
85	16	111	0.44
86	13.9	112	0.38
87	12.1	113	0.33
88	10.6	114	0.29
89	9.2	115	0.25
90	8	116	0.22
91	7.0	117	0.19
92	6.1	118	0.16
93	5.3	119	0.14
94	4.6	120	0.125
95	4	121	0.11
96	3.5	122	0.095
97	3.0	123	0.082
98	2.6	124	0.072
99	2.3	125	0.063
100	2	126	0.054

101	1.7	127	0.047
102	1.5	128	0.041
103	1.3	129	0.036
104	1.1	130	0.031
105	1		

In the above table, the reference duration, T, is computed by

$T = 8 / 2^{(L-90)/5}$

where L is the measured A-weighted sound level.

II. Conversion Between “Dose” and “8-Hour Time-Weighted Average” Sound Level.

Noise exposure is usually measured with an audiodosimeter which gives a readout in terms of “dose.” Dosimeter readings can be converted to an 8-hour time-weighted average sound level (TWA).

In order to convert the reading of a dosimeter into TWA, use Table A-2. This table applies to dosimeters that are set to calculate dose or percent exposure according to the relationships in Table A-1. So, for example, a dose of 91 percent over an eight hour day results in a TWA of 89.3 dB, and a dose of 50 percent corresponds to a TWA of 85 dB.

If the dose as read on the dosimeter is less than or greater than the values found in Table A-2, the TWA may be calculated by using the formula:

$TWA = 16.61 \log^{10} (D/100) + 90$ where TWA = 8-hour time-weighted average sound level and D = accumulated dose in percent exposure.

Table A-2
Conversion from “Percent Noise Exposure” or “Dose” to “8-Hour Time-Weighted Average Sound Level” (TWA)

Dose or Percent Noise Exposure	TWA	Dose or Percent Noise Exposure	TWA	Dose or Percent Noise Exposure	TWA
10	73.4	116	91.1	510	101.8
15	76.3	117	91.1	520	101.9
20	78.4	118	91.2	530	102.0
25	80.0	119	91.3	540	102.2
30	81.3	120	91.3	550	102.3
35	82.4	125	91.6	560	102.4
40	83.4	130	91.9	570	102.6
45	84.2	135	92.2	580	102.7
50	85.0	140	92.4	590	102.8
55	85.7	145	92.7	600	102.9
60	86.3	150	92.9	610	103.0
65	86.9	155	93.2	620	103.2
70	87.4	160	93.4	630	103.3
75	87.9	165	93.6	640	103.4
80	88.4	170	93.8	650	103.5
81	88.5	175	94.0	660	103.6
82	88.6	180	94.2	670	103.7
83	88.7	185	94.4	680	103.8
84	88.7	190	94.6	690	103.9

85	88.8	195	94.8	700	104.0
86	88.9	200	95.0	710	104.1
87	89.9	210	95.4	720	104.2
88	89.1	220	95.7	730	104.3
89	89.2	230	96.0	740	104.4
90	89.2	240	96.3	750	104.5
91	89.3	250	96.6	760	104.6
92	89.4	260	96.9	770	104.7
93	89.5	270	97.2	780	104.8
94	89.6	280	97.4	790	104.9
95	89.6	290	97.7	800	105.0
96	89.7	300	97.9	810	105.1
97	89.8	310	98.2	820	105.2
98	89.9	320	98.4	830	105.3
99	89.9	330	98.6	840	105.4
100	90.0	340	98.8	850	105.4
101	90.1	350	99.0	860	105.5
102	90.1	360	99.2	870	105.6
103	90.2	370	99.4	880	105.7
104	90.3	380	99.6	890	105.8
105	90.4	390	99.8	900	105.8
106	90.4	400	100.0	910	105.9
107	90.5	410	100.2	920	106.0
108	90.6	420	100.4	930	106.1
109	90.6	430	100.5	940	106.2
110	90.7	440	100.7	950	106.2
111	90.8	450	100.8	960	106.3
112	90.8	460	101.0	970	106.4
113	90.9	470	101.2	980	106.5
114	90.9	480	101.3	990	106.5
115	91.1	490	101.5	999	106.6
		500	101.6		

Note: Authority and reference cited: Section 142.3, Labor Code.

HISTORY

1. Editorial correction of Table A-1 filed 3-22-84; effective thirtieth day thereafter (Register 84, No. 12).
2. Amendment of Table A-1 filed 8-28-84; effective thirtieth day thereafter (Register 84, No. 35).
3. Change without regulatory effect amending Table A-2 filed 4-14-2009 pursuant to section 100, title 1, California Code of Regulations (Register 2009, No. 16).

Appendix B: Methods for Estimating the Adequacy of Hearing Protector

https://www.dir.ca.gov/title8/sb7g15a105apb.html

Attenuation

I. For employees who have experienced a standard threshold shift, hearing protector attenuation must be sufficient to reduce employee exposure to a TWA of 85 dB. Employers must select one of the following methods by which to estimate the adequacy of hearing protection attenuation.

II. The most convenient method is the Noise Reduction Rating (NRR) developed by the Environmental Protection Agency (EPA). According to EPA regulation, the NRR must be shown on the hearing protector package. The NRR is then related to an individual worker's noise environment in order to assess the adequacy of the attenuation of a given hearing protector. This Appendix describes four methods of using the NRR to determine whether a particular hearing protector provides adequate protection within a given exposure environment. Selection among the four procedures is dependent upon the employer's noise measuring instruments.

III. Instead of using the NRR, employers may evaluate the adequacy of hearing protector attenuation by using one of the three methods developed by the National Institute for Occupational Safety and Health (NIOSH), which are described in the "List of Personal Hearing Protectors and Attenuation Data," HEW Publication No. 76-120, 1975, pages 21-37. These methods are known as NIOSH methods #1, #2 and #3. The NRR described below is a simplification of NIOSH method #2. The most complex method is NIOSH method #1, which is probably the most accurate method since it uses the largest amount of spectral information from the individual employee's noise environment. As in the case of the NRR method described below, if one of the NIOSH methods is used, the selected method must be applied to an individual's noise environment to assess the adequacy of the attenuation. Employers should be careful to take a sufficient number of measurements in order to achieve a representative sample for each time segment.

NOTE: The employer must remember that calculated attenuation values reflect realistic values only to the extent that the protectors are properly fitted and worn.

IV. When using the NRR to assess hearing protector adequacy, one of the following methods must be used:

(a) When using a dosimeter that is capable of C-weighted measurements:

(1) Obtain the employee's C-weighted dose for the entire workshift, and convert to TWA (see Appendix A).

(2) Subtract the NRR from the C-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.

(b) When using a dosimeter that is not capable of C-weighted measurements, the following method may be used:

(1) Convert the A-weighted dose to TWA (see Appendix A).

(2) Subtract 7 dB from the NRR.

(3) Subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.

(c) When using a sound level meter set to the A-weighting network:

(1) Obtain the employee's A-weighted TWA.

(2) Subtract 7 dB from the NRR, and subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.

(d) When using a sound level meter set on the C-weighting network:

(1) Obtain a representative sample of the C-weighted sound levels in the employee's environment.

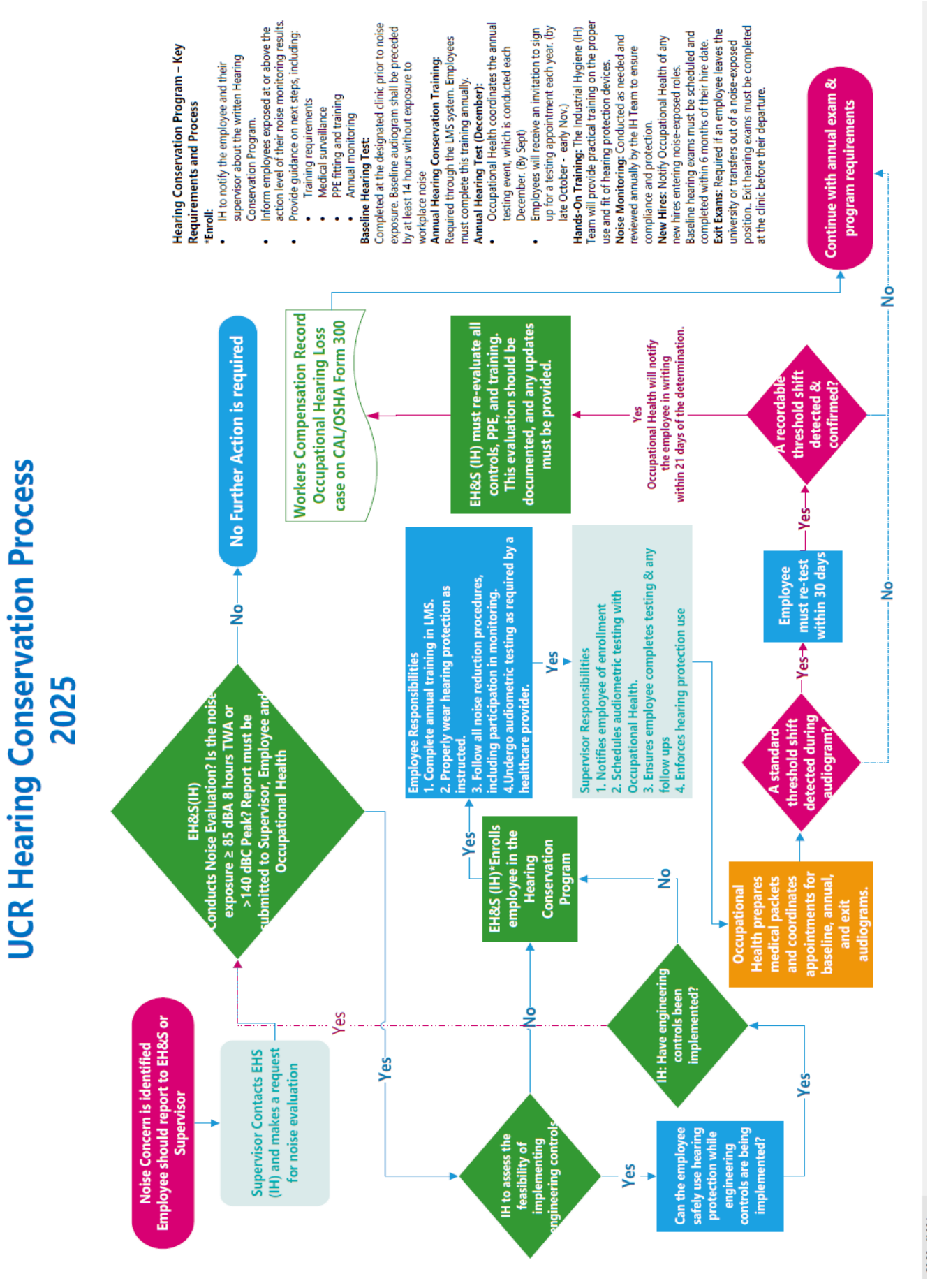
(2) Subtract the NRR from the C-weighted average sound level to obtain the estimated A-weighted TWA under the ear protector.

NOTE: Authority and reference cited: Section 142.3, Labor Code.

HISTORY

1. Amendment filed 10-3-83; effective thirtieth day thereafter (Register 83, No. 41)

Appendix C: UCR Hearing Conservation Process



CAUTION
HIGH NOISE AREA EAR
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Appendix E: Enrollment Checklist

The Hearing Conservation Program (HCP) is required for employees exposed to occupational noise levels at or above 85 dBA (8-hour TWA). Upon enrollment, please ensure the following requirements are completed and maintained:

Upon Enrollment

- ☐ **Baseline Audiometric Exam**
  - **Schedule and complete hearing test at the designated clinic before assignment to noise exposure.**
- ☐ **Initial Online Training**
  - **Complete the Hearing Conservation Training module in the UC Learning Management System (LMS).** Hearing Conservation 2.0 – CAL/OSHA.
- ☐ **Hands-On PPE Training**
  - **Attend in-person training provided by the Campus Industrial Hygiene (IH) Team on proper use and fit of hearing protection devices.**

Annual Requirements

- ☐ **Annual Audiometric Test**
  - **Conducted each December via a mobile hearing test vendor.**
  - **You will receive an email invitation to schedule your test.**
- ☐ **Annual Online Training**
  - **Re-take the LMS Hearing Conservation module each year to remain compliant.** Hearing Conservation 2.0 – CAL/OSHA.
- ☐ **Noise Monitoring (As Needed)**
  - **Participate in dosimetry or area monitoring if reassigned to new tasks, equipment, or work areas with potential elevated noise exposure.**

Supervisor Responsibilities

- ☐ **Notify EH&S of New Hires**
  - **Immediately inform the Occupational Health team of any new or reassigned employees who require hearing conservation enrollment.**
- ☐ **Ensure Exit Exams Are Scheduled**
  - **If an employee leaves UCR or transitions out of a noise-exposed position, ensure they complete an exit audiometric exam.**

Additional Notes

- ☐ **Employees must use hearing protection in designated high-noise areas at all times.**
- ☐ **Standard hearing protection (ear plugs) replacement is available by contacting EH&S or the IH Team. Departments must manage specialized equipment needs. It is the responsibility of the department to pick up hearing protection from EH&S.**
- ☐ **All program records are maintained in accordance with Cal/OSHA regulations.**

Program Contacts

- **For medical questions, baseline exams, and referrals: EH&S Occupational Health – ehsocchealth@ucr.edu**
- **For training, hands-on PPE instruction, and noise monitoring: EH&S Industrial Hygiene (IH) Team ehsih@ucr.edu.**