

UC Santa Barbara Hearing Conservation Program Manual

Rev. February 2018



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I. Purpose/Introduction

The purpose of this program is to protect UCSB employees from hearing loss due to occupational noise exposure. Although UCSB attempts to control noise to the extent possible, certain operations may expose faculty, staff, or students to significant noise levels. All personnel who are regularly exposed to occupational noise levels at or exceeding an 8-hour time-weighted average (TWA) of 85 dBA shall be included in the Hearing Conservation Program (HCP). This applies only to employees who incur exposure as part of their regularly assigned job duties.

This program was written to comply with Cal/OSHA regulations for Hearing Conservation (CCR, Title 8, Section 5097).

II. Applicability/Scope

The UCSB Hearing Conservation Program, through the requirements described in this manual, establishes procedures and responsibilities for UCSB students, faculty, staff and volunteers while engaged in University related activities.

III. Roles/Responsibilities

A. Department Heads and Chairs

Directors and Department Chairs are responsible for:

- Providing the necessary resources to ensure the health and safety of their employees;
- Identifying individuals as supervisors and ensuring they are trained on their health and safety responsibilities;
- Ensuring departmental compliance with campus health and safety policies and procedures;
- Ensuring hazards workplace hazards are identified and controlled.

B. Managers, Supervisors, and Principal Investigators

Managers, Supervisors, and Principal Investigators are responsible for:

- Ensuring their units understand and comply with the requirements of this program;
- Identifying noisy operations and controlling them to the greatest extent possible;
- Requesting EH&S evaluate noisy operations that cannot be controlled;
- Providing hearing protective devices to employees and ensure that employees use such devices when appropriate;
- Ensuring employees exposed to noise levels at or above the Action Level are enrolled in the HCP;
- Posting signage in noisy areas requiring the use of hearing protection.

C. Employees, Students and Volunteers:

Employees, Students and Volunteers are responsible for:

- Understanding and complying with campus health and safety policies and procedures;
- Notifying their supervisor or EH&S about any hazardous conditions observed on the worksite;
- Wearing approved hearing protective devices when required;
- Maintaining hearing protection in sanitary condition and proper working order;
- Reporting noise hazards and hearing protection problems to the appropriate supervisor or EHS.

D. Environmental Health & Safety (EH&S)

The UCSB Hearing Conservation Program is administered by EH&S. EH&S will function as a technical resource to departments and will assist them in carrying out their responsibilities as necessary. Specifically, EH&S is responsible for:

- Developing and maintaining the Hearing Conservation Program and ensuring it meets all applicable regulatory requirements;
- Monitoring work site noise levels as requested and informing employees and supervisors of results;
- Recommending appropriate engineering and administrative noise control measures.
- Assisting employees in selection of proper protective devices and providing instruction on their use;
- Providing training on noise hazards and hearing conservation.

E. Sansum Occupational Medicine Clinic (SOMC)

Sansum Occupational Medicine Clinic (SOMC) is responsible for:

- Providing baseline, annual, and post-employment audiometric exams;
- Establishing any work restrictions necessary to prevent additional hearing loss;
- Communicating audiogram results, restrictions and any identified standard threshold shifts to EHS, the employee and their supervisor.

IV. Definitions

Action level - The exposure at which an employee must be enrolled in the Hearing Conservation Program. *Cal/OSHA has set the current action level at an 85 A-weighted decibels (dBA) average over an eight-hour period or a 50 percent dose.

Audiometric testing - Exams that measure the sensitivity of a person's hearing threshold in decibels. The testing also establishes a baseline hearing threshold that is compared to later exams to determine if hearing loss has occurred.

Decibel (dB) - The standard unit used to measure sound level. The A-weighted decibel scale, abbreviated as dBA, is commonly used to measure sounds heard by the human ear. The decibel scale is logarithmic, and every three dBA is a doubling of the sound level.

Hertz (Hz) - The unit of measure for noise frequency in cycles per second. (1 cycle/ second = 1Hz)

Permissible exposure limit (PEL) - The maximum legal noise exposure, established by Cal/OSHA. The current 8-hour time-weighted average Permissible Exposure Limit (PEL) for noise is 90 dBA (2016).

Noise reduction rating (NRR) - A measure of the noise reduction that a given hearing protective device provides.

Standard threshold shift (STS) - A change in hearing threshold relative to the baseline audiogram of an average of 10 dBA or more at 2000, 3000, and 4000 Hz in either ear.

UCSB Recommended Exposure Limit – The maximum recommended noise exposure, established by the American Conference of Governmental Industrial Hygienists (ACGIH). The current 8-hour time-weighted average Threshold Limit Value (TLV) for noise is 85 dBA (2016).

V. Program Requirements

A. 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 controls are used to control the hazard at its source and should be implemented prior to using administrative controls whenever possible. The basic concept behind engineering controls is that, to the extent feasible, the work environment and the job itself should be designed to eliminate hazards or reduce exposure to hazards. These may include:

- Quieter machinery
- Quieter processes
- Reduction of noise transmission
- Isolation of equipment or equipment operator
- Proper maintenance of machinery and equipment
- Purchasing procedures that specify criteria for maximum noise levels

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

B. Noise Assessments and Exposure Monitoring

Noise exposure is described either in terms of an 8-hour time-weighted average sound level or a noise dose (in percent of the Permissible Exposure Limit). When employee exposure to occupational noise is equal to or exceeds an 8-hour time-weighted average of 85 dBA, or equivalently, a dose of 50 percent or greater, the employee must be included in the HCP.

Employees or their supervisors should contact EH&S to schedule noise monitoring if they suspect exposures to excessive noise on the job, or if previously monitored noise levels have changed due to modifications to equipment or processes. EH&S should also be contacted to schedule monitoring if the hearing protection in use is suspected of being inadequate. If desired, employees or their representatives may observe the noise monitoring procedure by arranging with EH&S prior to the date of the monitoring. An employee's exposure shall be determined using the methods listed below.

Preliminary Noise Assessment

A preliminary noise assessment consists of a walkthrough of all facility areas with a sound-level meter to identify operations or areas where employees may be exposed to hazardous noise levels. In this study, measurements are recorded as close as practical to the employee's workstation at approximated ear level. A facility layout or grid of plant areas may be useful for recording noise levels and identifying areas that require further study. While this study is intended as an overview

of noise exposure, consideration should include variations in noise levels due to shift changes, operation of noise generating equipment, or other factors that could affect baseline levels.

Noise assessments are also used to identify campus locations or operations where noise levels exceed 90 dBA. These are areas where hearing protection should *always* be worn. Where information indicates that employees in that area may be exposed to noise levels equal to or exceeding the action level, individual exposure monitoring shall be conducted.

Exposure Monitoring

EH&S performs noise exposure monitoring for faculty, staff, and students who may be exposed to noise over Cal/OSHA's 85-decibel dBA action level on an eight-hour time-weighted average basis. Personal or area exposure monitoring is conducted using a noise dosimeter to identify employees and students for inclusion in the Hearing Conservation Program and to enable the proper selection of hearing protection.

Evaluations of employee exposure are recorded via the UCSB Noise Dosimetry Form. This form allows for the documentation of all necessary information including name of employee, job classification, employee number; date, location, and results of measurements; and description of the noise measurement equipment and calibration information. Persons whose noise exposures have been monitored will receive written notification of their exposure monitoring results from EH&S.

C. Program Enrollment

Persons whose eight-hour time-weighted average noise exposure exceeds the action level must be enrolled in the Hearing Conservation Program. These individuals will be required to receive audiometric testing, participate in hearing conservation training and wear hearing protection when appropriate. Persons whose eight-hour time-weighted average noise exposure is less than 85 dBA will not be enrolled in the campus Hearing Conservation Program, and generally do not require audiometric testing or training.

Examples of campus personnel who may exceed the Action Level and require enrollment in the HCP are:

- Campus Shop Workers
- Emergency Responders
- Engineering Students, Faculty and Staff
- Facilities Management Staff
- Grounds Keepers
- Housing and Residential Services Staff

In order to remain enrolled in the UCSB Hearing Conservation Program individuals must be up to date on all training and audiometric test requirements. EH&S will notify program enrollees and their supervisors approximately one (1) month before the person becomes due for training or audiometric testing. When an individual is three (3) or more months overdue for one or more of the enrollment requirements, EH&S will notify the employee and their supervisor that the user has been unenrolled from the program, and that they shall no longer perform work activities that require enrollment in the Hearing Conservation Program.

D. Audiometric Testing

When an employee is enrolled in the UCSB Hearing Conservation Program, they must complete baseline, annual, and post-employment audiometric tests. Audiometric tests can be scheduled by calling Sansum Occupational Medicine Clinic (898-3311). It is the responsibility of the supervisor of

the identified department to schedule audiometric exams. The cost of the audiograms shall be covered by the employee's department.

To ensure accuracy, the audiometric test should be preceded by at least 14 hours without exposure to workplace or non-workplace noise. This will reduce the potential for the employee to be suffering from a temporary threshold shift, which would result in an incorrect evaluation of the employee's hearing threshold. Hearing protection may be used to provide the pre-test exposure control, providing its use is well supervised.

Baseline Audiograms

Everyone enrolled in the Hearing Conservation Program must undergo testing to establish a baseline audiogram and to determine the person's "hearing threshold" and against which to compare subsequent audiograms. It is desirable to obtain the baseline audiogram as soon as possible (preferably within 60 days) from the date of the employee's first exposure to high noise levels and that employees be protected from workplace noise for at least 14 hours prior to the audiometric test in order to obtain a valid measurement.

Annual Audiogram

Audiograms shall also be obtained at least annually for each employee exposed at or above the time-weighted average of 85 dBA. It is important to ensure that employees are protected from workplace noise for at least 14 hours prior to the audiometric test in order to obtain a valid measurement.

Post-Employment Audiogram

Post-employment audiograms must be completed when an employee leaves the job or workplace where he or she is no longer routinely exposed to noise level at or above an 8-hour time-weighted average of 85 dBA. It is the responsibility of the employee and the supervisor to complete a postemployment audiogram. It is important to ensure that employees are protected from workplace noise for at least 14 hours prior to the audiometric test in order to obtain a valid measurement.

Evaluation of the Audiogram

An audiologist will evaluate audiometric test results and schedule any necessary follow-up evaluations. When medical personnel identify an employee with a significant threshold shift or a baseline audiogram showing early indications of hearing loss (i.e., an existing hearing level of 25 dB or greater between 500 and 4000 Hz, according to ANSI s3.6-1969), this information will be provided to EH&S so the appropriate hearing conservation and training activities can be initiated to reduce the potential for further hearing loss. The employee will be notified of these results in writing within 30 days. He or she will be retrained on the hazards and precautions of working in noisy environments and will be issued hearing protective devices if they are determined appropriate by EH&S and SOMC. Other modifications to the workplace may also be needed to reduce noise exposures to prevent additional hearing loss.

E. Significant Threshold Shifts

In the event that a significant threshold shift is detected, the employee should undergo another audiogram within 30 days of the first test to confirm the threshold shift. If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift, the employee shall be informed of this fact, in writing, within 21 days of the determination.

If a physician determines that the standard threshold shift is work related or aggravated by occupational noise exposure, the following steps shall be taken when a standard threshold shift occurs:

1. An employee not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.
2. An employee already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
3. Exposure monitoring shall be conducted to reassess the employee's exposure to noise.
4. Refer the employee for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the employer suspects that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
5. Inform the employee of the need for an otological examination if a medical pathology of the ear which is unrelated to the use of hearing protectors is suspected.

F. Hearing Protection Equipment

Provision of Hearing Protection Equipment

Where required, departments shall provide hearing protection to employees at no cost. Hearing equipment shall be immediately replaced by the department when broken, defective, or unsanitary. EH&S can help determine appropriate types of hearing protection for specific situations, and provide training on its proper use and care upon request.

Selection of Hearing Protection Equipment

Hearing protection shall exceed the minimum noise attenuation rating required to ensure the employee's noise exposure is below the permissible exposure limit. For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposures to an 8-hour time-weighted average of 85 decibels or below. Employees shall be given the opportunity to provide input in the selection process.

Hearing Protection Noise Attenuation

Noise Reduction Rating (NRR) is a unit of measurement used to determine the effectiveness of hearing protection devices to decrease sound exposure within a given working environment. The higher the NRR number associated with a hearing protector, the greater the noise attenuation it provides. However, the effectiveness of hearing protection can be greatly reduced if the hearing protectors do not fit or are not worn properly, or if they are worn only part time during periods of noise exposure. The adequacy of hearing protector attenuation shall be reevaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation.

When selecting hearing protection the following method by which to estimate the adequacy of hearing protection attenuation shall be used:

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.

Use of Hearing Protection Equipment

It is the responsibility of managers, principal investigators, and supervisors to ensure that campus personnel wear appropriate hearing protection when required.

At UCSB, the use of hearing protection is required:

- For all personnel exposed above the 85 dBA TWA action level.
- During operations or in areas where the ambient noise levels meet or exceed 90 dBA.
- For all individual who have experienced a standard threshold shift.

- In all areas posted or otherwise designated as requiring hearing protection.

F. Signage

In all locations where noise levels are expected to exceed 90 dBA due to the operation of noisy equipment or machinery, signage must be installed to warn people that they must wear hearing protection when the noisy equipment is in use. For example, in the various pump stations across campus, signage has been installed stating, "Hearing protection must be worn when pumps are operating". Contact EH&S to coordinate the installation of signage if it is necessary in your work area.

G. Training

Hearing conservation training is required for all employees who are enrolled in the HCP. Additionally, information regarding the Hearing Conservation shall be available to all employees through the UCSB Hearing Conservation Website, employee orientation, job training and instruction, specific training programs, or periodic safety meetings. See Section VI for specific HCP enrollee training requirements.

VI. Training Requirements

Hearing conservation training is required for all employees who are enrolled in the HCP and shall be repeated at least annually. Training is provided by EH&S and can be customized for specific work groups. Both the employee's department and EH&S shall maintain training records (See Section VII for specific record keeping requirements). Training topics shall include the following:

- The effects of noise on hearing;
- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care;
- The purpose of audiometric testing, and an explanation of the test procedures.
- Areas where hearing protection must be worn;
- Requirements of UCSB's Hearing Conservation Program.

VII. Record Keeping

A. Exposure Monitoring

Noise exposure measurement records are maintained by the Industrial Hygiene division of EH&S. Area noise exposure data are retained for a minimum of two years, and personal exposure data are retained indefinitely.

B. Audiometric Testing

Audiometric test results are maintained by the employee's department and should be retained for the duration of the person's employment at UCSB. SOMC can provide prior copies of audiometric test records at the department's request.

Employees have the right to review records of their noise exposure data and audiometric tests. It is a common procedure that these records are made available to employees.

C. Training

Departments shall retain training records for at least ten years after the person has retired or left University employment. Training completed/recorded on the Learning Management System (LMS) is kept indefinitely.

VIII. References

State Regulations:

[Hearing Conservation Program](#), California Code of Regulations, Title 8, Section 5097, California Department of Industrial Relations **State regulations:**

Title 8, California Code of Regulations, Article 105, Sections 5096-5100:
"Control of Noise Exposure"

Federal Regulations:

29 CFR 1910.95: "Occupational Noise Exposure"

American National Standards Institute (ANSI):

S1.11-1971: "Specification for Octave, Half-Octave, and Third-Octave Band Filter Sets"

S1.25-1978: "Specification for Personal Noise Dosimeters"

S1.4-1971: "Specification for Sound Level Meters"

S3.6-1969: "Specifications for Audiometers"

IX. Issued By and Next Review Date

Issued by: Nick Nieberding, Industrial Hygiene Specialist

Date: February 2018

Review Date: Annually

X. Attachments

Attachment A: Sansum Audiometric Evaluation Form

Attachment A



AUDIOMETRIC EVALUATION FORM

Name (Last) First Name M.I. Employer:
Last 4 digits Social Security # Date of Birth Sex Occupation
Home Address City/State Zip Code Date of Exam

Do you currently have or have you recently had:

- 1. Head injury with unconsciousness Yes ___ No ___
2. Severe dizziness Yes ___ No ___
3. Ear or mastoid surgery Left ___ Right ___ Both ___ No ___
4. Severe ear infections Left ___ Right ___ Both ___ No ___
5. Excessive ear wax Left ___ Right ___ Both ___ No ___
6. Ear drainage or pain Left ___ Right ___ Both ___ No ___
7. Perforated ear drum Left ___ Right ___ Both ___ No ___
8. Ringing in your ears Left ___ Right ___ Both ___ No ___
9. Sudden fluctuating hearing loss Left ___ Right ___ Both ___ No ___
10. Exposure to noise in previous jobs Yes ___ No ___
11. Exposure to noise in the military service Yes ___ No ___
What branch: Army ___ Navy ___ Air Force ___ Marines ___ Other ___
Were you in combat? Yes ___ No ___
12. All jobs included, how many years have you worked in noise? ___
13. Are you exposed to off-the-job noise from motorcycles, firearms, loud music, use of power tools, flying or a second job? (circle all applicable) Yes ___ No ___
14. Do you have a known hearing loss? Left ___ Right ___ Both ___ No ___
15. Do you wear a hearing aid? Left ___ Right ___ Both ___ No ___
16. Do you have a cold? Yes ___ No ___
17. Are you taking an antibiotic? Yes ___ No ___
18. At the end of your shift do your ears ring? Left ___ Right ___ Both ___ No ___
19. Did you work in noise today? Hours since last on the job? ___ Yes ___ No ___
20. Did you use hearing protection? What type? ___ Yes ___ No ___
21. Is there anyone in your family who uses a hearing aid? Yes ___ No ___
22. Do you smoke, or did you smoke? How many years? ___ Yes ___ No ___

I certify that the above statements and answers to the above questions are accurate to the best of my knowledge and that the results of my hearing test may be provided to my employer for the purpose of conducting a hearing conservation program.

Signature Date



AUDIOMETRIC EVALUATION FORM

Name _____ (Last) _____ (First) _____ (M.I.) _____ Employer _____

Employee should be noise free for 14 hours prior to the audiogram. Note below if employee has not been noise free for 14 hours. Note number of noise free hours.

Classification: _____ Baseline Exam _____ Annual Exam
 _____ *Repeat Exam at: _____ Revised Baseline
 14 hour noise free _____
 40 hour noise free _____

Left Ear							Right Ear						
500	1000	2000	3000	4000	6000	8000	500	1000	2000	3000	4000	6000	8000

Left ear _____ Right ear _____

Otoscopy by: _____
 * If a significant threshold shift (STS) is suspected, confirm by conducting a second 14 hour noise free audiogram. If a change is again present, perform a 40 hour noise free audiogram. If the 40 hour noise free audiogram indicates a significant threshold shift, the employee must be advised to follow-up with an Ear, Nose and Throat specialist for evaluation of hearing loss. Employee must also be referred back to the employer for additional hearing protection training.

Medical Provider's Evaluation Comments and Recommendations:

Employee is: _____ **Cleared-Baseline established**
 _____ Advised to return to clinic for a 14 hr. noise free audiogram. _____ Cleared with no change in Baseline
 _____ Advised to return to clinic for a 40 hr. noise free audiogram. _____ Cleared with change in Baseline
 (Significant threshold shift confirmed)
 _____ Referred to ENT for further evaluation of non-work related hearing loss. _____ **-AND-** Referred to ENT for further evaluation of hearing loss

 Physician's Signature & Date

 Physician's Printed Name
 101 S Patterson Ave
 Santa Barbara, CA 93111
 Ph: 805-898-3344 Fx: 805-964-9645