

# CHANNEL ISLANDS HEARING CONSERVATION PROGRAM

## 1.0 PURPOSE

To establish and maintain an effective noise control and hearing conservation program in order to prevent hearing loss as a result of work related noise exposure.

## 2.0 AUTHORITY

California Code of Regulations, Title 8, Section 5095 through 5100, "Control of Noise Exposure," and Code of Federal Regulations, Title 29 Part 1910.95, "Occupational Noise Exposure," administered by California Division of Occupational Safety and Health (Cal-OSHA).

Code of Federal Regulations, Title 29 Part 1910.95.

## 3.0 DEFINITIONS

### ACTION LEVEL:

Any 8-hour time-weighted average of 85 decibels measured on the A- scale, slow response, or equivalently, a dose of fifty percent.

### AUDIOGRAM:

A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

### BASELINE AUDIOGRAM:

The audiogram against which future audiograms are compared.

### DECIBEL: (dB):

Unit of measurement of sound level.

### DECIBEL-A-WEIGHTED (dBA):

A unit of measurement of sound level corrected to the A- weighted scale, as defined in ANSI S 1.4-1971 (R1976), using a reference level of 20 micropascals.

## 4.0 SCOPE

This program applies to all employees who are exposed to noise over the OSHA defined action level.

## **5.0 RESPONSIBILITIES**

### **5.1 ENVIRONMENT, SAFETY & RISK MANAGEMENT:**

- a. Establish and update the written Hearing Conservation Program.
- b. Identify employees to be included in the Hearing Conservation Program.
- c. Provide consultation/training to departments according to their specific needs.
- d. Conduct noise surveys in response to department requests or as a general noise survey.
- e. Assist department in developing methods for noise abatement, reduction, or control.
- f. Recommend personal protective devices for applicable departments.
- g. Maintain and make available records of exposure measurements.

### **5.2 OPERATIONS, PLANNING AND CONSTRUCTION:**

- a. With EH&S, identify employees to be included in the Hearing Conservation Program.
- b. With EH&S, conduct noise surveys in response to new sources.
- c. Assist in developing methods for noise abatement, reduction, or control.
- d. Schedule regular audiometric tests for included employees.
- e. Maintain and make available records of exposure measurements.

### **5.3 SUPERVISORS:**

- a. Ensure that noise control is considered when procuring equipment, machinery, and tools.
- b. Identify work areas that may over expose employees to harmful levels of noise and notify the Safety and Risk office.
- c. Develop methods for noise abatement, reduction, or control.
- d. Ensure employees covered by the Hearing Conservation Program attend annual Hearing Conservation training and comply with all appropriate procedures.
- e. Department supervisors should ensure that employees are not exposed to excess occupational noise 14 hours prior to their audiogram.
- f. Ensure that appropriate personal protective equipment is provided to affected employees; enforce the use of such devices when required; ensure that devices are kept in good condition and maintained in a sanitary manner.

### **5.4 EMPLOYEES:**

- a. Employees are ultimately responsible for the wearing of hearing protection whenever working in noisy environments.
- b. Read and comply with all appropriate hearing conservation safety procedures while performing assigned duties.
- c. Identify areas which have excessive occupational noise and notify their supervisors.

## **6.0 CONTROLLING OCCUPATIONAL NOISE EXPOSURE**

There are three types of control measures that may be used to limit noise exposures. In preferential order, they are engineering, administrative, and personal protective controls. Engineering controls are generally permanent solutions, whereas administrative controls and personal protective controls require constant monitoring to ensure adequate implementation.

## **6.1 ENGINEERING CONTROLS:**

Noise control through engineering practice is the preferred control method as it is an attempt to remove the hazard. This allows the sound intensity to be reduced either at the source or in the hearing zone of the worker. Examples include:

- a. Replacing worn, loose, or unbalanced parts (e.g. replace mufflers when needed on gasoline engines).
- b. Lubricating machines.
- c. Substituting the machinery or process.
- d. Modifying the path between the noise source and the worker. This includes installing absorption materials, silencers, barriers and acoustical enclosures around noise sources.

## **6.2 ADMINISTRATIVE CONTROLS:**

Administrative controls limit the length of time workers are exposed to noise in the work area. Examples include:

- a. Rotate workers to job assignments with lower exposure levels throughout their 8-hour work day.
- b. Schedule machine operating times during hours with less workers exposed.
- c. Rotate worker's shifts.

## **6.3 PERSONAL PROTECTIVE EQUIPMENT:**

When engineering and/or administrative controls either fail to reduce noise to within required limits, or are not feasible, hearing protective devices must be used.

- a. When either earmuffs or ear plugs are used, the department should have a sufficient variety to ensure that workers can get a good fit.
- b. Protective devices should be both effective and comfortable.
- c. All workers must be trained before being issued hearing protection. Workers must wear hearing protectors when:
  1. They are exposed to a sound level of 85 dBA or greater and have had a significant threshold shift in hearing.
  2. They are exposed to noise in excess of the limits set in Cal-OSHA Title 8, Section 5096 (Appendix A).

## **7.0 MEDICAL SURVEILLANCE**

### **AUDIOMETRIC TESTS:**

Audiometric testing is the method used for determining an individual's hearing threshold level and measuring if an individual has experienced hearing loss. Audiometric tests are performed by audiologists or technicians who are certified by the Council of Accreditation in Occupational Hearing Conservation. The results of the tests are called audiograms.

- a. All employees included in the Hearing Conservation Program shall have an audiogram within 6 months of their first exposure.

- b. Annual audiograms must be routinely compared to baseline audiograms to determine if a standard threshold shift exists.
- c. Employees with standard threshold shifts must be fitted or refitted with adequate hearing protection devices.

## 8.0 TRAINING

All employees exposed at or above the Action Level must participate in the Hearing Conservation Program. Participants shall receive annual training in the requirements of this program. Training shall include the following elements:

- a. The effects of noise on hearing.
- b. The purpose, advantages, disadvantages, and attenuation characteristics of various types of hearing protection.
- c. Instruction on the selection, fitting, use, and care of hearing protectors.
- d. The purpose of audiometric testing and test procedures.

## 9.0 RECORDKEEPING

### RECORDS:

- a. Noise exposure documentation shall be maintained by Environment, Safety and Risk Management
- b. Training records shall be maintained by Environment, Safety and Risk Management or OPC as appropriate.
- c. Audiometric test results shall be maintained by OPC and provided to effected employees. Audiometric tests shall be maintained for the duration of employee's employment.

### APPENDIX: Control of Noise Exposure (California Code of Regulations, Title 8, Sections 5095 – 5100)

#### ➡ § 5095. General.

(a) Scope and Application. Article 105 establishes requirements for controlling occupational exposures to noise. Agriculture, construction, and oil and gas well drilling and servicing operations are exempt from the provisions of Sections 5097 through 5100.

(b) Definitions.

**Action Level.** An 8-hour time-weighted average of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of fifty percent.

**Audiogram.** A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**Audiologist.** A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech, Hearing and Language Association or licensed by a state board of examiners.

**Baseline Audiogram.** The audiogram against which future audiograms are compared.

**Criterion Sound Level.** A sound level of 90 decibels.

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

**dBA (Decibels-A-Weighted).** A unit of measurement of sound level corrected to the A-weighted scale, as defined in ANSI S1.4-1971 (R1976), using a reference level of 20 micropascals (0.00002 Newton per square meter).

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

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

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

**Representative Exposure.** Measurements of an employee's noise dose or 8-hour time-weighted average sound level that the employer deems to be representative of exposures of other employees in the workplace.

**Sound Level.** Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit: decibels (dB). For use with this regulation, SLOW time response, in accordance with ANSI S1.4-1971 (R1976), is required.

**Sound Level Meter.** An instrument for the measurement of sound level.

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

#### HISTORY

1. Repealer of Group 15 (Article 105, Sections 5095-5099) and new Group 15 (Article 105, Sections 5095-5100 and Appendices A-E) filed 6-28-82; effective thirtieth day thereafter (Register 82, No. 27). For prior history, see Register 72, No. 6.
2. Amendment filed 10-3-83; effective thirtieth day thereafter (Register 83, No. 41).
3. Amendment of group heading filed 6-3-97; operative 7-3-97 (Register 97, No. 23).

#### § 5096. Exposure Limits for Noise.

(a) Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table N-1 of this section when measured on the A-scale of a standard sound level meter at slow response.

(b) When employees are subjected to sound levels exceeding those listed in Table N-1 of this section, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of the table, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

Table N-1 Permissible Noise Exposure [\[FN1\]](#)

	Permitted Duration		Permitted Duration
Sound	Per	Sound	per Workday

Level (dBA)	Workday (hours-minutes)	hours	Sound Level (dBA)	(hours-minutes)	hours
90.....	8-0.....	8.00	103.....	1-19.....	1.32
91.....	6-58.....	6.96	104.....	1-9.....	1.15
92.....	6-4.....	6.06	105.....	1-0.....	1.00
93.....	5-17.....	5.28	106.....	0-52.....	0.86
94.....	4-36.....	4.60	107.....	0-46.....	0.76
95.....	4-0.....	4.00	108.....	0-40.....	0.66
96.....	3-29.....	3.48	109.....	0-34.....	0.56
97.....	3-2.....	3.03	110.....	0-30.....	0.50
98.....	2-38.....	2.63	111.....	0-26.....	0.43
99.....	2-18.....	2.30	112.....	0-23.....	0.38
100....	2-0.....	2.00	113.....	0-20.....	0.33
101....	1-44.....	1.73	114.....	0-17.....	0.28
102....	1-31.....	1.52	115.....	0-15.....	0.25

[FN1] When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions:  $C_{sub1} / T_{sub1} + C_{sub2} / T_{sub2} \dots C_{subn} / T_{subn}$  exceeds unity, then, the mixed exposure should be considered to exceed the limit value.  $C_{subn}$  indicates the total time of exposure at a specified noise level, and  $T_{subn}$  indicates the total time of exposure permitted at that level.

(c) If the variations in noise level involve maxima at intervals of 1 second or less, the noise is to be considered continuous.

(d) Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

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

### § 5097. Hearing Conservation Program.

(a) General. The employer shall administer a continuing, effective hearing conservation program, as described in this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A-scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with Appendix A and Table A-1 and without regard to any attenuation provided by the use of personal protective equipment.

(b) Monitoring.

(1) When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, the employer shall obtain measurements for employees who may be exposed at or above that level. Such determinations shall be made by December 1, 1982.

(2) The monitoring requirement shall be met by either area monitoring or personal monitoring that is representative of the employee's exposure.

(A) The sampling strategy shall be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.

(B) Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring generally inappropriate, the employer shall use representative personal sampling to comply with the monitoring requirements of this section unless the employer can show that area sampling produces equivalent results.

(C) All continuous, intermittent and impulsive sound levels from 80 dB to 130 dB shall be integrated into the computation.

(D) Instruments used to measure employee noise exposure shall be calibrated to ensure measurement accuracy.

(3) Monitoring shall be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

(A) Additional employees may be exposed at or above the action level; or

(B) The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of Section 5098(b).

(4) The employer shall provide affected employees or their representatives with an opportunity to observe any measurements of employee noise exposure which are conducted pursuant to this section.

(5) The employer shall notify each employee exposed at or above the action level of the results of the monitoring.

(c) Audiometric Testing Program.

(1) The employer shall establish and maintain an audiometric testing program as provided in this section by making audiometric testing available to all employees whose exposures equal or exceed the action level.

(2) The program shall be provided at no cost to employees.

(3) Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.

(4) All audiograms obtained pursuant to this section shall meet the requirements of Appendix B: Audiometric Measuring Instruments.

(5) The employer shall establish for each employee exposed at or above the action level a valid baseline audiogram against which subsequent audiograms can be compared.

(6) Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. This requirement may be met by wearing hearing protectors which will reduce the employee's exposure to a sound level of 80 dBA or below.

(7) The employer shall notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.

(8) Audiometric tests shall be made available to employees by June 1, 1983 or within 6 months of an employee's first exposure at or above the action level, except that where a mobile test van is used to conduct the audiometric test, the test shall be made available within one year of an employee's first exposure at or above the action level provided that all such employees are given an opportunity for testing.

Note: This requirement may be met by an audiogram available to the employer upon the effective date of this section provided the conditions under which the audiometric test was performed were the same as prescribed by this section.

(9) Where an employer chooses to have audiometric tests performed by a mobile test van in accordance with Section 5097(c)(8) and an employee's baseline audiogram has not been obtained within 6 months of the employee's first exposure at or above the action level, the employer shall make hearing protectors available to the employee in accordance with Section 5098 and require that the hearing protectors are worn by the employee until the baseline audiogram is obtained.

(10) At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above the action level.

(d) Evaluation of Audiogram.

(1) Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift, as defined in Section 5097(d)(8), has occurred. This comparison may be done by a technician.

(2) If the annual audiogram shows that an employee has suffered a standard threshold shift, the employer may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.

(3) An audiologist, otolaryngologist or physician shall review problem audiograms and shall determine whether there is a need for further evaluation. The employer shall provide to the person performing this evaluation the following information:

(A) A copy of the requirements for hearing conservation as set forth in Sections 5097, 5098, 5099 and 5100.

(B) The baseline audiogram and most recent audiogram of the employee to be evaluated.

(C) Measurements of background sound pressure levels in the audiometric test room as required in Appendix C, Audiometric Test Rooms.

(D) Records of audiometric calibrations required by paragraph (f) of this section.

(4) If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined by Section 5097(d)(8), the employee shall be informed of this fact, in writing, within 21 days of the determination.

(5) Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the employer shall ensure that the following steps are taken when a standard threshold shift occurs:

(A) An employee not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them; and

(B) 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.



(C) 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.

(D) 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.

(6) If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour time-weighted average of 90 decibels indicates that a standard threshold shift is not persistent, the employer:

(A) Shall inform the employee of the new audiometric interpretation; and

(B) May discontinue the required use of hearing protectors for that employee.

(7) An annual audiogram may be substituted for the baseline audiogram when in the judgment of the audiologist, otolaryngologist or physician who is evaluating the audiogram:

(A) The standard threshold shift revealed by the audiogram is persistent; or

(B) The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

(8) As used in this section, a standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000 and 4000 Hz in either ear.

(9) In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F: Determination and Application of Age Correction to Audiograms.

(e) Audiometric Test Requirements.

(1) Audiometric tests shall be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000 and 6000 Hz. Tests at each frequency shall be taken separately for each ear.

(2) Audiometric tests shall be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used in accordance with, ANSI S3.6-1969.

(3) Pulsed-tone and self-recording audiometers, if used, shall meet the requirements specified in Appendix B, Audiometric Measuring Instruments.

(4) Audiometric examinations shall be administered in a room meeting the requirements listed in Appendix C, Audiometric Test Rooms.

(f) Audiometer Calibration.

(1) The functional operation of the audiometer shall be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds. Deviations of 10 dB or greater shall require an acoustic calibration.

(2) Audiometer calibration shall be checked acoustically at least annually in accordance with Appendix D, Acoustic Calibration of Audiometers. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 dB or greater necessitate an exhaustive calibration.

(3) An exhaustive calibration shall be performed at least every two years in accordance with Sections 4.1.2, 4.1.3, 4.1.4.3, 4.2, 4.4.1, 4.4.2, 4.4.3, and 4.5 of ANSI S3.6-1969. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration.

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).

#### § 5098. Hearing Protectors.

(a) General.

(1) Employers shall make hearing protectors available to all employees exposed to an 8-hour time-weighted average of 85 decibels or greater at no cost to the employees. Hearing protectors shall be replaced as necessary.

(2) Employers shall ensure that hearing protectors are worn by all employees:

(A) Who are required by Section 5096(b) to wear personal protective equipment; or

(B) Who are exposed to an 8-hour time-weighted average of 85 decibels or greater, and who:

1. Are required by Section 5097(c)(9) to wear hearing protectors because baseline audiograms have not yet been established; or

2. Have experienced a standard threshold shift.

(3) Employees shall be given the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by the employer.

(4) The employer shall provide training in the use and care of all hearing protectors provided to employees.

(5) The employer shall ensure proper initial fitting and supervise the correct use of all hearing protectors.

(b) Hearing Protector Attenuation.

(1) The employer shall evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. The employer shall use one of the methods described in Appendix E, Methods for Estimating the Adequacy of Hearing Protector Attenuation.

(2) Hearing protectors must attenuate employee exposure at least to an 8-hour time-weighted average of 90 decibels as required by Section 5096(b).

(3) 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.

(4) 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. The employer shall provide more effective hearing protectors where necessary.

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).

## **§ 5099. Training Program.**

### (a) General.

(1) The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 dBA, and shall ensure employee participation in such program.

(2) The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.

(3) The employer shall ensure that each employee is informed of the following:

(A) The effects of noise on hearing;

(B) The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and

(C) The purpose of audiometric testing, and an explanation of the test procedures.

### (b) Access to Information and Training Materials.

(1) The employer shall make available to affected employees or their representatives copies of Article 105 and shall also post a copy in the workplace.

(2) The employer shall provide to affected employees any informational materials pertaining to this standard that are supplied to the employer by U.S. Department of Labor, Occupational Safety and Health Administration.

(3) The employer shall provide, upon request, all materials related to the employer's training and education program pertaining to this standard to authorized representatives of the Chief of the Division and the Director, National Institute for Occupational Safety and Health.

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

## **§ 5100. Recordkeeping.**

### (a) Exposure Measurements.

The employer shall maintain an accurate record of all employee exposure measurements required by Section 5097(b).

### (b) Audiometric Tests.

(1) The employer shall retain all employee audiograms obtained pursuant to Section 5097(c) and (d).

(2) This record shall include:

(A) Name and job classification of the employee.

(B) Date of the audiogram.

(C) The examiner's name.

(D) Date of the last acoustic or exhaustive calibration of the audiometer.

(E) Employee's most recent noise exposure assessment.

(c) Audiometric Test Rooms.

The employer shall maintain accurate records of the measurements required by Appendix C, Audiometric Test Rooms, of the background sound pressure levels in audiometric test rooms.

(d) Record Retention. The employer shall retain records required in this section for at least the following periods:

(1) Noise exposure measurement records shall be retained for 2 years.

(2) Audiometric test records shall be retained for the duration of the affected employee's employment.

(e) Access to Records. All records required by this section shall be provided upon request to employees, former employees, representatives designated by the individual employee and any authorized representative of the Chief of the Division. The provisions of Sections 3204(a)-(g) and (h) apply to access to records required by this section.

(f) Transfer of Records. If the employer ceases to do business, the employer shall transfer to the successor employer all records required to be maintained by this section, and the successor employer shall retain them for the remainder of the period prescribed in Section 5100(d).