

CALIFORNIA STATE UNIVERSITY, FRESNO

HEARING CONSERVATION PROGRAM



Office of
Environmental Health and Safety

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Hearing Conservation Program

1.0 Regulatory Authority

California Code of Regulations, Title 8, Article 105, Sections 5095 to 5100 (see Appendix A); and Title 29, Code of Federal Regulations, Section 1910.95.

2.0 Policy

2.1 It is the policy of California State University, Fresno to establish and maintain effective noise control and hearing conservation programs designed to eliminate or control, as so far as is reasonable and practical, overexposure to harmful noise among students, faculty, and staff.

2.2 The University shall identify noisy areas on campus and shall take steps to protect personnel who work in these areas. When noise cannot be controlled by administrative and engineering controls, the University shall distribute hearing protectors to all employees exposed to an 8-hour time-weighted average noise level of 90 decibels or greater. Under certain conditions, employees shall be required to use hearing protectors.

2.3 The University shall provide at no cost to employees a hearing exam program designed to provide safe job placement, satisfactory maintenance of hearing, and to ascertain the effectiveness of noise control methods.

3.0 Purpose

The purpose of this program is to establish a coordinated approach toward controlling excessive occupational noise exposure as directed by University policy and state law.

4.0 Scope

The Hearing Conservation Program affects all employees exposed to an 8-hour time-weighted average noise level of 85 dBA or greater. These levels either have been or may potentially be found in the following departments:

- Boiler/Chiller Plant
- Carpenter's/Metal Shop
- Groundskeeping
- Theatre Arts Scene Shop
- Print Shop
- Agricultural Mechanics Shop

All other employees that believe they are working in an environment above 85 dBA TWA should notify the Office of Environmental Health and Safety.

5.0 Control of Noise Exposure

The State of California and the Federal Government regulate a worker's exposure to noise. The regulations set exposure limits and detail the University's responsibilities when the limits are exceeded.

The following is a summary of the safety orders regulating exposure of workers to occupational noise. The actual regulations are attached for reference (See Appendix A).

5.1 Hearing Conservation Program

When workers are exposed to an 8-hour time-weighted average (TWA) of 85 decibels (dBA) or greater, the university must institute a hearing conservation program. This program will include monitoring of exposure, an audiometric testing program for all exposed workers and an expert evaluation of the test results.

Required audiometric testing must be conducted by an expert (licensed audiologist, otolaryngologist, qualified physician, or trained technician). The

results will be made available to employees. Annual audiograms are compared with the baseline audiogram to determine if there has been any deterioration of the worker's hearing (threshold shift).

5.2 Hearing Protectors

Workers must wear hearing protectors when:

5.2.1 They are exposed to a sound level in excess of the limits set in Section 5096(b); or

5.2.2 They are exposed to a sound level of 85 dBA or greater and have experienced a standard threshold shift in hearing, or are required by Section 5097(c)(9).

Hearing protectors shall be made available to workers when the sound level exceeds an 8-hour TWA of 85 dBA.

5.3 Training Program

Workers who are exposed to noise at or above an 8-hour time-weighted average of 85 dBA shall participate in an annual training program. The program will include the effects of noise on hearing, the purpose and effectiveness of hearing protectors, and the purpose of and an explanation of audiometric testing.

5.4 Recordkeeping and Records Access

The employer will maintain records of exposure measurements for at least two (2) years; and audiometric tests for the duration of the affected employee's employment.

These records must be made available upon request to employees, former employees, employee representatives (with prior written approval from the affected employee), and authorized representatives of the Division of Occupational Safety and Health.

6.0 Responsibilities

6.1 Human Resources

- 6.1.1 New employees assigned to work in areas listed in Section 4.0 shall be referred to the Office of Environmental Health and Safety to determine if a baseline audiogram is required.
- 6.1.2 If an audiogram is required, it shall be performed within the first two weeks of the employee's assignment.
- 6.1.3 An exit audiogram shall be given to every separating employee who has been a participant in medical monitoring. This exam shall be performed prior to the employee's last day of employment.

6.2 Office of Environmental Health and Safety

- 6.2.1 Coordinate the campus Hearing Conservation Program, providing consultation to departments according to their specific needs.
- 6.2.2 Conduct noise surveys in response to department requests or upon the Office of Environmental Health and Safety's initiative.
- 6.2.3 Assist departments in developing methods for noise abatement, reduction or control.
- 6.2.4 Establish and conduct an audiometric testing program for appropriate employees, providing consultation and notification of exam results.
- 6.2.5 Maintain and make available records of exposure measurements and audiometric tests.
- 6.2.6 Maintain records of general training activities.

6.3 Departments

- 6.3.1 Ensure that noise control is considered when procuring equipment, machinery and tools.
- 6.3.2 Identify noisy work areas that may overexpose employees to harmful levels of noise and notify the Office of Environmental Health and Safety.
- 6.3.3 Develop methods for noise abatement, reduction or control.
- 6.2.4 Purchase personal protective devices.
- 6.3.5 Train or arrange training for employees covered by the Hearing Conservation Program; and ensure that they read, understand and comply with all appropriate procedures.
- 6.3.6 Ensure that appropriate personal protective equipment is provided to appropriate employees; enforce the use of such devices when required; ensure that such devices are kept in good repair and maintained in a sanitary manner.
- 6.3.7 Ensure that employees are made available for audiometric testing when such testing is required.

6.4 Employees

- 6.4.1 Employees are ultimately responsible for the wearing of hearing protection whenever working in noisy environments.
- 6.4.2 Read and comply with all appropriate hearing conservation safety procedures while performing assigned duties.
- 6.4.3 Use common sense and good judgment at all times; the unlimited number of potential hazards that may exist or be created in the work place is sometimes unpredictable.

7.0 Sound Levels

The table in Appendix B shows some common equivalents of sound levels in decibels (dBA). Exposure to noise with a loudness of 80 dB is annoying. It is roughly equivalent to the noise level of an alarm clock about two feet from your ear. Exposure to 90 dBA can cause physical damage to the ear. At about 120 dBA, hearing actually becomes painful and damage to hearing, certain and rapid. Appendix C lists the average measured noise level output of equipment used at California State University, Fresno.

8.0 Effects of Overexposure

8.1 The ear has three sections (See Appendix D). The outer ear helps to direct sound into the auditory canal. The middle ear, separated from the outer ear by the eardrum, consists of three connected bones which transmit the vibrations of the eardrum to the inner ear. In the inner ear a coiled hearing organ, the cochlea, transforms the vibrations into nerve impulses for transmission to the brain along the auditory nerve. The cochlea is lined with cells equipped with tiny hairs and is filled with liquid. As the liquid moves in response to the vibrations of the bones of the middle ear, the hairs move, sending nerve impulses to the brain for decoding. The effects of continued overexposure to noise are the destruction of the hair cells and a permanent loss of hearing.

8.2 The first warning of hearing loss is often the inability to hear high frequency sounds. People with hearing deficiencies caused by overexposure to noise lose sensitivity to sound at about 4,000 Hz, the approximate frequency of a bird's song or a voice on the telephone. If the overexposure continues, the range will gradually be extended until the entire hearing is affected. As more and more hair cells of the inner ear are destroyed, the ability to hear is progressively and permanently reduced. Damaged hair cells cannot be repaired or replaced. As a person loses sensitivity to higher frequencies, sound becomes distorted. A person may be able to hear a conversation but not be able to understand it. The use of a hearing aid makes the sound louder, but it is still distorted.

8.3 Overexposure to noise affects the entire body. It is associated with tinnitus (ringing in the ears), increased pulse rate, hypertension, increased secretion of certain hormones, tiredness, nervousness, sleeplessness, and other symptoms of stress.

9.0 Noise Survey

9.1 How can you tell there is a noise problem where you work? Common indications of overexposure to noise are temporary hearing loss and muffled speech, ringing in the ears after leaving the work area, or difficulty hearing normal speech in the work area.

9.2 If you suspect that there is a noise problem, the next step is to request a noise survey. The purpose of the survey is to measure the noise levels workers are exposed to, find the source of the noise, and determine what corrective measures to take, if any. If a noise survey is needed, the affected employee may inform his/her supervisor who will in turn request this service from the Office of Environmental Health and Safety.

10.0 Controlling Noise

If the noise survey reveals an overexposure problem, the following are alternative ways to reduce the exposure to within acceptable limits.

10.1 Administrative Controls

These may also be referred to as operational controls. These controls limit the length of time workers are exposed to the noise in the work area. This involves assigning the worker to less noisy areas in the workplace so that the average of his/her daily exposure is less than the permissible exposure limit. The choice of which kind of controls to use is governed by the particular noise control problem being encountered.

10.2 Engineering Controls

Noise levels can be controlled by making changes in the machinery, the way the machinery operates, or the design of the structure in which the machinery is housed. Engineering controls include barriers, damping, isolation, muffling, noise absorption, mechanical isolation, variation in force, pressure or driving speed, and combinations of these and other means of reducing noise emissions. The way that these solutions are applied depends on the particular source of the noise and the characteristics of the noise being produced. The practical application of noise controls requires the services of an experienced and innovative engineer.

10.3 Personal Protective Equipment

When administrative and/or engineering controls either fail to reduce noise to within required limits or are not technologically feasible. Hearing protectors must be used.

When either ear muffs or ear plugs are used, the department should have a sufficient variety to ensure that workers can get a good fit. Protective devices should be both effective and comfortable.

Sized ear plugs are made of safe, flexible material which will conform to the shape of the wearer's ear canal. Other plugs are malleable, made of cotton, paper, plastic, and other materials. They can be thrown away after each use and are designed to fill all ears.

When ear muffs are used, make sure that the seal between the muff and the head is tight. Long hair, glasses, and other obstructions may diminish the effectiveness of the device.

Appendix A

California Code of Regulations Title 8 Section 5095 et seq.

TITLE 8. Industrial Relations
Division 1. Department of Industrial Relations
Chapter 4. Division of Industrial Safety
Subchapter 7. General Industry Safety Orders
Group 15. Occupational Noise and Ergonomics
Article 105. Control of Noise Exposure

§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.

§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 ¹

Sound Level (dBA)	Permitted Duration Per Workday		Sound Level (dBA)	Permitted Duration per Workday	
	(hours-minutes)	hours		(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

¹ 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: $C_1/T_1 + C_2/T_2 \dots C_n/T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C_n indicates the total time of exposure at a specified noise level, and T_n 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.

§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.

§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.

§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.

§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).

Appendix B

Common Equivalent Sound Levels in Decibels

<u>Sound Level (dBA)</u>	<u>Example of Common Equivalent Sound</u>
0	Hearing Threshold
20	Whisper
40	Average Library
50	Average Office
60	Ordinary Conversation
70	Freight Train @ 100 ft
80	Noisy Restaurant
90	Printing Plant
100	Sports Arena
110	Wood/Metal Shop
120	Siren @ 100 ft
140	Jet Aircraft Takeoff
180	Rocket Launch

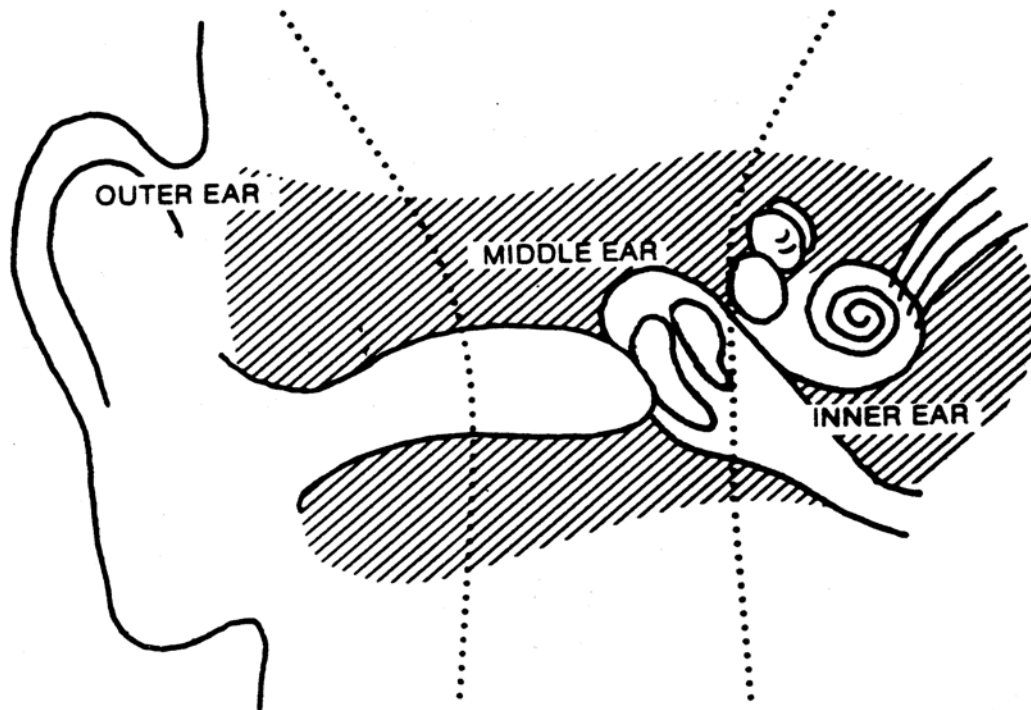
Appendix C

Noise Level Output of Equipment

<u>Equipment</u>	<u>Sound Level (dBA)</u>
Chain Saw	112
Jackhammer	110
Radial Saw	108
Table Saw	104
Planer	104
Leaf Blower	101
Jointer	96
Grinder	95
Concrete Saw	94
Rotary Mower	92
Grass Cutter	91
Belt Sander	91
Band Saw	88
Lathe	84
Disc Sander	83
Photocopier	78

Appendix D

Effects of Overexposure on the Human Ear



The ear has three sections. The outer ear helps to direct sound into the auditory canal. The middle ear, separated from the outer ear by the eardrum, consists of three connected bones which transmit the vibrations of the eardrum to the inner ear. In the inner ear a coiled hearing organ (the cochlea) transforms the vibrations into nerve impulses for transmission to the brain along the auditory nerve. The cochlea is lined with cells equipped with tiny hairs and is filled with liquid. As the liquid moves in response to the vibrations of the bones of the middle ear, the hairs move sending nerve impulses to the brain for decoding.

The effect of continued overexposure to noise is the destruction of the hair cells and a permanent loss of hearing. As more and more hair cells of the inner ear are destroyed, the ability to hear is progressively and permanently reduced. Damaged hair cells cannot be repaired or replaced.

Overexposure to noise affects the entire body. It is associated with tinnitus (ringing in the ears), increased pulse rate, hypertension, increased secretion of certain hormones, tiredness, nervousness, sleeplessness and other symptoms of stress.