



HEARING CONSERVATION PROGRAM

FOR

SOUTHEAST MISSOURI STATE UNIVERSITY
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Submitted to

SOUTHEAST MISSOURI STATE UNIVERSITY

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SECTION ONE - INTRODUCTION

The Southeast Missouri State University Hearing Conservation Program falls within the scope of the University's Occupational Safety and Environmental Health (OSEH) policy (see Section XXX in the Business Policy and Procedure Manual). Evidence is well established that worker exposure to noise of sufficient intensity and duration can result in hearing damage. Noise-induced hearing loss rarely results from just one exposure; it can progress unnoticed over a period of years. Initial noise-induced hearing loss occurs at the higher frequencies where the consonant portion of speech is found, making communications difficult.

1.1 PROGRAM ELEMENTS

The primary goal of the University's Hearing Conservation Program is to reduce, and eventually eliminate to the extent possible, hearing loss due to workplace noise exposures. The program includes the following elements:

- **Noise Level Surveys** - Work environments will be surveyed to identify potentially hazardous noise levels and personnel at risk.
- **Engineering Controls** - Equipment that produces potentially hazardous noise should, wherever it is technologically and economically feasible, be modified to reduce the noise level to acceptable levels.
- **Administrative Controls** - These include work site rotations that limit the time that the employee is exposed to high levels of noise.
- **Personal Protection Devices** - Where engineering and administrative controls are not feasible, the use of hearing protective devices will be employed.
- **Audiometric Testing** - Periodic hearing testing will be conducted to monitor the effectiveness of the Hearing Conservation Program. Early detection of temporary threshold shifts will allow further protective action to be taken before permanent hearing loss occurs.
- **Education and Training** - An understanding by employees of the permanent nature of noise-induced hearing loss, the University's Hearing Conservation Program, and the employee's responsibilities under the program are essential for program effectiveness.

The Occupational Safety and Health Administration (OSHA) requirements (29 CFR 1910.95) for permissible noise exposures are shown in the table below.

Permissible Noise Exposures	
Duration per Day, Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

If the sound levels listed above are exceeded, feasible administrative or engineering controls will be instituted. If these controls fail to reduce the sound levels to within those listed above, hearing protection will be provided and used to reduce the sound levels to an acceptable level. Whenever employee noise exposures equal or exceed an 8-hour time-weighted average (TWA) of 85 dBA, slow response, an effective hearing conservation measures will be instituted.

SECTION TWO - RESPONSIBILITIES

2.1 Risk Management Department

RM is responsible for developing, implementing, and administering the University's Hearing Conservation Program, including:

- Identification of work areas and equipment within University facilities where noise levels equal or exceed 85 dBA.
- Identification, through personnel monitoring, of University employees whose noise exposure level equals or exceeds an 8-hour TWA of 85 dBA. Notification of employee exposure measurements is sent to the their supervisor and employee medical file.
- Annual re-monitoring of identified at-risk employees.
- Resurvey of work areas and equipment where noise levels exceed 85 dBA every two years, and areas that have new equipment.
- Training of employees in the need for, proper use, and care of hearing protection devices.
- Identification of noise control measures and developing recommendations.
- Coordination and scheduling of health and safety training.
- Maintenance of documentation of the training courses presented in accordance with OSEH program requirements.

2.2 Administrators, Department Heads, Managers, Supervisors, and Faculty

- Provide work or learning environments that minimize noise to the greatest extent reasonable.
- Provide hearing protection devices for employees and students where needed.
- Request RM to evaluate noisy operations
- Ensure that employees exposed to noise above the permissible levels defined above are given training and provided with audiometric exams and hearing protection devices.
- Provide easy access to hearing protection devices and ensure that employees use such devices where appropriate.
- Post areas known to present noise hazards with signs requiring the use of hearing protectors.

2.3 Employees and Students

- Wear approved hearing protection devices in posted noise hazard areas.

- Maintain hearing protectors in sanitary condition and proper working order.
Report noise hazards and hearing protector problems to the appropriate supervisor.

SECTION THREE - NOISE EVALUATION AND SURVEILLANCE PROCEDURES

3.1 Identification of Hazardous Noise Areas

RM will identify work areas where noise levels equal or exceed 85 dBA. Records shall be maintained by RM and updated at least every two years (or after installation of new equipment) to determine if any alteration in noise levels has occurred. Those areas where the noise levels are below 85 dBA will not be routinely monitored. Identification of hazardous noise areas and equipment and any subsequent noise monitoring will be conducted by RM.

Signs will be posted at the entrance to any work area where noise levels exceed 85 dBA, requiring anyone entering the area to wear proper hearing protection. Personnel who work in these areas shall have hearing protection supplied to them, shall be instructed in its proper use, and be required to wear this equipment when in these identified areas. It is the responsibility of the area supervisor to ensure that these precautions are maintained.

Equipment that produces noise levels greater than 85 dBA, or 120 dB peak sound pressure levels shall also be appropriately labeled.

3.2 Noise Measurements and Exposure Assessments

In order to effectively control noise it is necessary that the noise be accurately measured according to standard procedures and that the measurements be properly evaluated against accepted criteria. All noise monitoring will be conducted in accordance with established standard operating procedures.

The monitoring of employees for noise exposure is made up of two parts; general area monitoring and personal monitoring. Area measurements are generally obtained first. If noise levels are at or above 85 dBA, personal monitoring using dosimeters is then performed. Measurement data sheets will be used to record monitoring data for both general area and personal noise monitoring results.

3.2.1 Area Measurements

In a general area survey, measurements of environmental noise levels are recorded using a sound level meter to identify work areas where employee exposures may be above hazardous levels, and where more thorough exposure monitoring may be needed. Area monitoring is conducted using a calibrated sound level meter set to the

“A” scale, slow response. Within the area of interest, several different locations will be measured. Typical measurement locations include:

- In the hearing zone at the employee's normal work location.
- Next to the noise source(s).
- At the entrance(s) to the work area.
- At other locations within the area where the employee might spend time working. A rough sketch of the area will be included with the results showing the locations where the noise readings were obtained.

If the noise levels are below 85 dBA on a time-weighted average basis in the area, no further routine monitoring will be required for that area. Should any of the noise measurements equal or exceed 85 dBA, records shall be maintained as to the noise levels recorded, where they were taken, and the source(s) of the noise. These records shall be updated at least once every two years (or after installation of new equipment) to determine if any changes have occurred that would warrant re-monitoring of exposed personnel. If any of the measurements equal or exceed a noise level of 85 dBA, employees who work in or near the high noise area or equipment shall have their noise exposure determined through personnel monitoring using dosimeters.

3.2.2 Personnel Monitoring

Determination of the noise exposure level will be accomplished using calibrated noise dosimeters. Each employee to be monitored will have a dosimeter placed on him/her at the beginning of his/her normal work shift with the microphone placed in the "hearing zone". The dosimeter will be worn for the full duration of the work shift while the employee performs his/her normal work routine. At the end of the work shift, the dosimeter will be removed and information printed out as soon as possible. Background information will be collected from each employee detailing job description, unusual job activities, etc., for the time period sampled. Those employees whose noise exposure equals or exceeds 85 dBA on an 8-hour TWA will be included in the University Hearing Conservation Program.

3.3 Re-monitoring of Hazardous Noise Areas

All areas where noise levels equal or exceed 85 dBA shall be re-monitored at least every two years (or after installation of new equipment). Employees who work for extended periods of time (>2 hours) in the high noise areas and where their 8-hour TWA equals or exceeds 85 dBA will be monitored every year to determine their personal noise exposure.

Whenever an employee exhibits a standard threshold shift, as determined by audiometric testing, the employee's work place shall be re-monitored to identify potential causes and remedial actions.

3.4 Re-monitoring Due to Changes

Any area with noise levels that equal or exceed 85 dBA shall also be re-monitored whenever a change in production process, equipment, or controls increase the noise exposure such that additional employees are exposed to noise levels at or above 85 dBA on a time-weighted average basis. Areas where the noise levels have dropped below 85 dBA due to alterations in equipment, controls or process changes shall be eliminated from the monitoring program.

SECTION FOUR - NOISE CONTROL METHODS

4.1 Engineering and Administrative Controls

The primary means of reducing or eliminating personnel exposure to hazardous noise is through the application of engineering controls. Engineering controls are defined as any modification or replacement of equipment, or related physical change at the noise source or along the transmission path that reduces the noise level at the employee's ear. Engineering controls such as mufflers on heavy equipment exhausts or on air release valves are required where possible.

Administrative controls are defined as changes in the work schedule or operations which reduce noise exposure. If engineering solutions cannot reduce the noise, administrative controls such as increasing the distance between the noise source and the worker or rotation of jobs between workers in the high noise area should be used if possible.

The use of engineering and administrative controls should reduce noise exposure to the point where the hazard to hearing is eliminated or at least more manageable.

4.2 Personal Protective Equipment

Hearing protective devices (ear plugs, muffs, etc.) shall be the permanent solution only when engineering or administrative controls are considered to be infeasible or cost prohibitive. Hearing protective devices are defined as any device that can be worn to reduce the level of sound entering the ear. All personnel shall wear hearing protection devices when they enter or work in an area where the operations generate noise levels of :

- Greater than 85 dBA sound levels, or
- 120 dB peak sound pressure level or greater

4.2.1 Types of Hearing Protective Devices

Hearing protective devices (HPDs) include the following:

a. Insert Type Earplugs

A device designed to provide an air-tight seal with the ear canal. There are three types of insert earplugs – pre-molded, formable, and custom earplugs.

➤ Pre-molded Earplugs

Pre-molded earplugs are pliable devices of fixed proportions. Two standard styles, single flange and triple flange, come in various sizes, and will fit most people. Personnel responsible for fitting and dispensing earplugs will train users on proper insertion, wear, and care. While pre-molded earplugs are reusable, they may deteriorate and should be replaced periodically.

➤ Formable

Formable earplugs come in just one size. Some are made of material that, after being compressed and inserted, expands to form a seal in the ear canal. When properly inserted, they provide noise attenuation values that are similar to those from correctly fitted pre-molded earplugs. Individual units may procure approved formable earplugs. Supervisors must instruct users in the proper use of these earplugs as part of the annual education program. Each earplug must be held in place while it expands enough to remain firmly seated. A set of earplugs with a cord attached is available. These earplugs may be washed and therefore are reusable, but will have to be replaced after two or three weeks or when they no longer form an airtight seal when properly inserted.

➤ Custom Molded Earplugs

A small percentage of the population cannot be fitted with standard pre-molded or formable earplugs. Custom earplugs can be made to fit the exact size and shape of the individual's ear canal. Individuals needing custom earplugs will be referred to an audiologist.

b. Earmuffs

Earmuffs are devices worn around the ear to reduce the level of noise that reaches the ear. Their effectiveness depends on an air-tight seal between the cushion and the head.

4.2.2 Selection of Hearing Protective Devices

Employees will be given the opportunity to select hearing protective devices from a variety of suitable ones provided by the Office of Health and Safety. In all cases the chosen hearing protectors shall have a Noise Reduction Ratio (NRR) high enough to reduce the noise at the ear-drum to 90 dBA or lower.

4.2.3 Issuance of Hearing Protective Devices (HPDs)

The issuance of hearing protective devices is handled through supervisory personnel who will issue hearing protective devices (foam inserts, disposables) and ensure that a comfortable fit is achievable. Instruction on the proper use and care of earplugs and earmuffs will be provided whenever HPDs are dispensed. Personnel requiring earmuffs in addition to earplugs will be informed of this requirement and educated on the

importance of using proper hearing protection. Again the supervisory personnel will dispense ear muffs when necessary and will maintain a supply of disposable earplugs.

4.2.4 Use of Hearing Protective Devices

- a. Always use and maintain HPDs as originally intended and in accordance with instructions provided.
- b. Earmuff performance may be degraded by anything that compromises the cushion-to-circum-aural flesh seal. This includes other pieces of personal protective equipment such as eyewear, masks, face-shields, and helmets.

4.2.5 Maintenance of Hearing Protective Devices

- a. Reusable earplugs, such as the triple flange or formable devices should be washed in lukewarm water using hand soap, rinsed in clean water, and dried thoroughly before use. Wet or damp earplugs should not be placed in their containers. Cleaning should be done as needed.
- b. Earmuff cushions should be kept clean. The plastic or foam cushions may be cleaned in the same way as earplugs, but the inside of the muff should not get wet. When not in use, ear-muffs should be placed in open air to allow moisture that may have been absorbed into the cups to evaporate.

4.2.6 Hearing Protection Performance Information

The maximum sound attenuation obtained by wearing hearing protection devices is limited by individual variations in the shape of the auditory canal as well as bone conduction mechanisms. Even though a particular device may provide outstanding values of noise attenuation, the actual noise reductions may be less because of the noise surrounding the head and body bypassing the hearing protector, which can be transmitted through tissue and bone pathways to the inner ear.

SECTION FIVE - MEDICAL SURVEILLANCE

5.1 Notification

Upon identification of those employees whose 8-hour TWA equals or exceeds 85 dBA, RM will recommend to the employee's Supervisor, in writing, of the need to enroll certain employee(s) in the Hearing Conservation Program. Information supplied to the audiometric professional will include the employee(s) name, supervisor's name, telephone number, and the noise levels recorded in the employee's work area, including dosimetry data. It will be the responsibility of the Supervisor to enroll his/her employee in the Hearing Conservation Program.

In work locations where either through administrative or engineering controls, noise levels are found to have fallen such that the employee's 8-hour TWA is below 85 dBA, RM shall notify the employee's Supervisor, by memo, that the employees working in that area are no longer required to be enrolled in the Hearing Conservation Program. The final decision as to an employee's enrollment status will be left with the University's audiometric professional.

The results of area and personal re-monitoring shall be forwarded to the audiometric professional upon completion of the noise surveys.

Any personnel experiencing difficulty in wearing assigned hearing protection (i.e., irritation of the canals, pain) will be advised to immediately report this to their supervisor and make arrangements to go to the Center for Health and Counseling for evaluation as soon as possible.

5.2 Audiometric Testing

The University's Communication Disorders Department has the responsibility for administering the Audiometric Testing Program portion of the University Hearing Conservation Program. The objectives of the audiometric testing program are to:

- Obtain a baseline of the employees hearing prior to the initiation of their work in high noise level environments.
- Follow-up audiograms to identify workers who are beginning to lose their hearing and to intervene before the hearing loss becomes worse.

Audiometric testing will be provided to all employees with exposure to noise levels of 85 dBA or greater. Annual retesting will be performed for all personnel enrolled in the Hearing Conservation Program.

SECTION SIX - TRAINING

The training and education program will provide information about the adverse effects of noise and how to prevent noise-induced hearing loss. At a minimum, all training will cover the following topics:

- Noise-induced hearing loss;
- Recognizing hazardous noise;
- Symptoms of overexposure to hazardous noise;
- Hearing protection devices - advantages and limitations.
- Selection, fitting, use, and maintenance of HPDs.
- Explanation of noise measurement procedures.
- Hearing conservation program requirements.

University employees shall be encouraged to use hearing protective devices when they are exposed to hazardous noise during activities at home (e.g., from lawn mowers and chain saws).

All personnel identified for inclusion in the Hearing Conservation Program should receive initial instruction in the requirements of the program. Ideally this will be done when hearing protection is dispensed. Refresher training annually thereafter will be provided by the immediate supervisor. Supervisors will be provided annual refresher training by RM.

Supervisors must contact RM (extension 6840) to schedule training for new personnel assigned to work in noisy environments and for refresher training.

SECTION SEVEN - PROGRAM EVALUATION

Annual program evaluations will be conducted to assess compliance with federal and state regulations and University Program requirements. Both the monitoring and audiometric testing portions of the University Hearing Conservation Program will be reviewed annually to assure its quality and effectiveness.

An evaluation of the Program, including wearer acceptance, appraisal of protection afforded, and field audits of hearing protection use and record-keeping will be conducted at least annually. Items to be considered include:

- Standard operating procedures
- Training records and course content for supervisors and employees.
- Maintenance of HPDs
- Field audits of HPD use
- Review of recorded threshold shifts.

The findings of the Hearing Conservation Program evaluation will be documented, and this documentation will list plans to correct faults in the program and set target dates for the implementation of the plans.

SECTION EIGHT - RECORDKEEPING

University Hearing Conservation Program records will include the following:

Medical Evaluations and Audiograms	Department Personnel Files
Training Records	Department Personnel Files
Hearing Conservation Program Manual	All departments that are required to attend Hearing Conservation training
Hazard Evaluations (Work area noise surveys, personnel monitoring)	Risk Management
Program Evaluations	Risk Management

All non-medical records (example, work area and equipment surveys) will be maintained for a period of five years. Results of hearing tests and medical evaluations performed for hearing conservation purposes as well as noise exposure documentation shall be recorded and shall be a permanent part of an employee's health record.

All personnel who routinely work in designated hazardous noise areas shall be identified and a current roster of such personnel shall be maintained and by Risk Management and updated periodically.

SECTION NINE - HEARING CONSERVATION PROGRAM REVIEW PAGE

In accordance with the University Hearing Conservation Program, a review and evaluation of this Program is conducted at least once every two years. As a result of this review and evaluation, Southeast Missouri State University will amend the Program within six months of the review to include more effective prevention and control technology if such technology will significantly reduce the likelihood of hearing loss to employees exposed to hazardous noise levels.

REVIEW DATE	SIGNATURE

REFERENCES

ACGIH, Threshold Limit Values and Biological Exposure Indices, Physical Agents, Noise, current edition

Berger, E. H., et.al., Ed., Noise & Hearing Conservation Manual, 4th ed., Akron, OH: American Industrial Hygiene Association, 1986.

NIOSH, A Practical Guide to Effective Hearing Conservation Programs in the Workplace, September 1990.

OSHA, General Industry Standard, 29 CFR 1910.95, "Occupational Noise Exposure"

Appendix A

Hearing Conservation - Training Information

Supervisors and exposed workers must become aware of and understand the potential adverse effects of noise levels and how to prevent noise-induced hearing loss. People exposed to hazardous noise must take positive action if progressive permanent hearing loss is to be prevented. Each exposed worker and supervisor should know the following.

- a. Noise exposure may result in permanent damage to the auditory system and there is no medical or surgical treatment for this type of hearing loss. Though the use of a hearing aid may provide some benefit, normal hearing will not be restored. Many people don't realize loud sounds can cause hearing loss. Furthermore, in its initial stages, the person may not notice a problem since noise-induced hearing loss is invisible, painless, and occurs in the high frequencies. It is dangerous to ignore the temporary characteristics of noise-induced hearing loss (e.g., ringing or buzzing in the ears, excessive fatigue).
- b. Each person should know how to recognize hazardous noise situations even if a noise survey has not been conducted and/or warning signs posted. Recognizing and understanding the potential adverse effects of off-duty noise exposures is also important. The best rule to follow is: "If you have to shout at arms length (approximately three feet) to talk face-to-face, you are probably being exposed to hazardous levels of noise."
- c. Preventing noise-induced hearing loss is accomplished by reducing both the time and intensity of exposure. Reducing exposure time is accomplished by avoiding any unnecessary exposure to loud sound. Reducing intensity is usually accomplished by engineering controls and/or wearing personal hearing protection devices. Each person must be able to properly wear and care for the particular type of hearing protection selected. Speech communication is difficult in high intensity noise. However, most people don't realize it's easier to understand speech if hearing protection is worn in a hazardous noise environment. Hearing protection reduces the noise and the level of speech, resulting in a more favorable listening level. Hearing protection reduces the intensity of frequencies above the speech range; thus, reducing the noise and accentuating speech. People who claim wearing hearing protection makes it difficult to hear speech are probably in noise levels less than 85 dBA or have already developed a hearing loss.

- d. Each person must know how to tell if they have been overexposed to loud sound. Overexposure may occur even while wearing hearing protection. Earplugs and/or earmuffs alone may not be enough protection. Each time a temporary threshold shift (TSS) occurs, a certain degree of permanent loss results. The recognizable symptoms of overexposure are described as "dullness in hearing or ringing in the ears."

Appendix B

Occupational Safety and Health Administration Standard - 29 CFR 1910.95 – Occupational Noise Exposure

OSHA Regulations (Standards - 29 CFR)

Occupational noise exposure. - 1910.95

- **Standard Number:** 1910.95
 - **Standard Title:** Occupational noise exposure.
 - **SubPart Number:** G
 - **SubPart Title:** Occupational Health and Environmental Control
-

Interpretation(s)

(a)

Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table G-16 when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows:

Equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on this graph and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from the actual A-weighted sound level of the noise, is used to determine exposure limits from Table 1.G-16.

(b)

(b)(1)

When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

(b)(2)

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

TABLE G-16 - PERMISSIBLE NOISE EXPOSURES (1)

Duration per day, hours	Sound level dBA slow response
8.....	90
6.....	92
4.....	95
3.....	97
2.....	100
1 1/2	102
1.....	105
1/2	110
1/4 or less.....	115

Footnote(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. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

..1910.95(c)

(c)

"Hearing conservation program."

(c)(1)

The employer shall administer a continuing, effective hearing conservation program, as described in paragraphs (c) through (o) of 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 G-16a, and without regard to any attenuation provided by the use of personal protective equipment.

(c)(2)

For purposes of paragraphs (c) through (n) of this section. an 8-hour time-weighted

average of 85 decibels or a dose of fifty percent shall also be referred to as the action level.

(d)

"Monitoring."

(d)(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 develop and implement a monitoring program.

(d)(1)(i)

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.

(d)(1)(ii)

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 paragraph unless the employer can show that area sampling produces equivalent results.

..1910.95(d)(2)

(d)(2)

(d)(2)(i)

All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels shall be integrated into the noise measurements.

(d)(2)(ii)

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

(d)(3)

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

(d)(3)(i)

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

(d)(3)(ii)

The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of paragraph (j) of this section.

(e)

"Employee notification." The employer shall notify each employee exposed at or above an 8-hour time-weighted average of 85 decibels of the results of the monitoring.

(f)

"Observation of monitoring." The employer shall provide affected employees or their representatives with an opportunity to observe any noise measurements conducted pursuant to this section.

..1910.95(g)

(g)

"Audiometric testing program."

(g)(1)

The employer shall establish and maintain an audiometric testing program as provided in this paragraph by making audiometric testing available to all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels.

(g)(2)

The program shall be provided at no cost to employees.

(g)(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 operates microprocessor audiometers does not need to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.

(g)(4)

All audiograms obtained pursuant to this section shall meet the requirements of Appendix C: "Audiometric Measuring Instruments."

(g)(5)

"Baseline audiogram."

(g)(5)(i)

Within 6 months of an employee's first exposure at or above the action level, the employer shall establish a valid baseline audiogram against which subsequent audiograms can be compared.

..1910.95(g)(5)(ii)

(g)(5)(ii)

"Mobile test van exception." Where mobile test vans are used to meet the audiometric testing obligation, the employer shall obtain a valid baseline audiogram within 1 year of an employee's first exposure at or above the action level. Where baseline audiograms are obtained more than 6 months after the employee's first exposure at or above the action level, employees shall wearing hearing protectors for any period exceeding six months after first exposure until the baseline audiogram is obtained.

(g)(5)(iii)

Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.

(g)(5)(iv)

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.

(g)(6)

"Annual audiogram." At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

(g)(7)

"Evaluation of audiogram."

(g)(7)(i)

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 paragraph (g)(10) of this section has occurred. This comparison may be done by a technician.

..1910.95(g)(7)(ii)

(g)(7)(ii)

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.

(g)(7)(iii)

The 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:

(g)(7)(iii)(A)

A copy of the requirements for hearing conservation as set forth in paragraphs (c) through (n) of this section;

(g)(7)(iii)(B)

The baseline audiogram and most recent audiogram of the employee to be evaluated;

(g)(7)(iii)(C)

Measurements of background sound pressure levels in the audiometric test room as required in Appendix D: Audiometric Test Rooms.

(g)(7)(iii)(D)

Records of audiometer calibrations required by paragraph (h)(5) of this section.

..1910.95(g)(8)

(g)(8)

"Follow-up procedures."

(g)(8)(i)

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined in paragraph (a)(10) of this section has occurred. the

employee shall be informed of this fact in writing, within 21 days of the determination.

(g)(8)(ii)

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:

(g)(8)(ii)(A)

Employees not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.

(g)(8)(ii)(B)

Employees 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.

(g)(8)(ii)(C)

The employee shall be referred 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.

(g)(8)(ii)(D)

The employee is informed of the need for an otological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.

..1910.95(g)(8)(iii)

(g)(8)(iii)

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

(g)(8)(iii)(A)

Shall inform the employee of the new audiometric interpretation; and

(g)(8)(iii)(B)

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

(g)(9)

"Revised baseline." 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:

(g)(9)(i)

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

(g)(9)(ii)

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

(g)(10)

"Standard threshold shift."

(g)(10)(i)

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.

..1910.95(g)(10)(ii)

(g)(10)(ii)

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: "Calculation and Application of Age Correction to Audiograms."

(h)

"Audiometric test requirements."

(h)(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.

(h)(2)

Audiometric tests shall be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used in accordance with. American National Standard Specification for Audiometers. S3.6-

1969, which is incorporated by reference as specified in Sec. 1910.6.

(h)(3)

Pulsed-tone and self-recording audiometers, if used, shall meet the requirements specified in Appendix C: "Audiometric Measuring Instruments."

(h)(4)

Audiometric examinations shall be administered in a room meeting the requirements listed in Appendix D: "Audiometric Test Rooms."

..1910.95(h)(5)

(h)(5)

"Audiometer calibration."

(h)(5)(i)

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 decibels or greater require an acoustic calibration.

(h)(5)(ii)

Audiometer calibration shall be checked acoustically at least annually in accordance with Appendix E: "Acoustic Calibration of Audiometers." Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 decibels or greater require an exhaustive calibration.

(h)(5)(iii)

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 the American National Standard Specification for Audiometers, S3.6-1969. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration.

(i)

"Hearing protectors."

(i)(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.

(i)(2)

Employers shall ensure that hearing protectors are worn:

(i)(2)(i)

By an employee who is required by paragraph (b)(1) of this section to wear personal protective equipment; and

..1910.95(i)(2)(ii)

(i)(2)(ii)

By any employee who is exposed to an 8-hour time-weighted average of 85 decibels or greater, and who:

(i)(2)(ii)(A)

Has not yet had a baseline audiogram established pursuant to paragraph (g)(5)(ii); or

(i)(2)(ii)(B)

Has experienced a standard threshold shift.

(i)(3)

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

(i)(4)

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

(i)(5)

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

(j)

"Hearing protector attenuation."

(j)(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

evaluation methods described in Appendix B: "Methods for Estimating the Adequacy of Hearing Protection Attenuation."

..1910.95(j)(2)

(j)(2)

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

(j)(3)

For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposure to an 8-hour time-weighted average of 85 decibels or below.

(j)(4)

The adequacy of hearing protector attenuation shall be re-evaluated 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.

(k)

"Training program."

(k)(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 decibels, and shall ensure employee participation in such program.

(k)(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.

(k)(3)

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

..1910.95(k)(3)(i)

(k)(3)(i)

The effects of noise on hearing;

(k)(3)(ii)

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

(k)(3)(iii)

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

(l)

"Access to information and training materials."

(l)(1)

The employer shall make available to affected employees or their representatives copies of this standard and shall also post a copy in the workplace.

(l)(2)

The employer shall provide to affected employees any informational materials pertaining to the standard that are supplied to the employer by the Assistant Secretary.

(l)(3)

The employer shall provide, upon request, all materials related to the employer's training and education program pertaining to this standard to the Assistant Secretary and the Director.

..1910.95(m)

(m)

"Recordkeeping" -

(m)(1)

"Exposure measurements." The employer shall maintain an accurate record of all employee exposure measurements required by paragraph (d) of this section.

(m)(2)

"Audiometric tests."

(m)(2)(i)

The employer shall retain all employee audiometric test records obtained pursuant to paragraph (g) of this section:

(m)(2)(ii)

This record shall include:

(m)(2)(ii)(A)

Name and job classification of the employee;

(m)(2)(ii)(B)

Date of the audiogram;

(m)(2)(ii)(C)

The examiner's name;

(m)(2)(ii)(D)

Date of the last acoustic or exhaustive calibration of the audiometer; and

(m)(2)(ii)(E)

Employee's most recent noise exposure assessment.

(m)(2)(ii)(F)

The employer shall maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.

(m)(3)

"Record retention." The employer shall retain records required in this paragraph (m) for at least the following periods.

..1910.95(m)(3)(i)

(m)(3)(i)

Noise exposure measurement records shall be retained for two years.

(m)(3)(ii)

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

(m)(4)

"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 the Assistant Secretary. The provisions of 29 CFR 1910.20 (a)-(e) and (g)-

(m)(4)(i)

apply to access to records under this section.

(m)(5)

"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 paragraph (m)(3) of this section.

(n)

"Appendices."

(n)(1)

Appendices A, B, C, D, and E to this section are incorporated as part of this section and the contents of these appendices are mandatory.

..1910.95(n)(2)

(n)(2)

Appendices F and G to this section are informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

(o)

"Exemptions." Paragraphs (c) through (n) of this section shall not apply to employers engaged in oil and gas well drilling and servicing operations.

(p)

"Startup date." Baseline audiograms required by paragraph (g) of this section shall be completed by March 1, 1984.

[39 FR 23502, June 27, 1974, as amended at 46 FR 4161, Jan. 16, 1981; 46 FR 62845, Dec. 29, 1981; 48 FR 9776, Mar. 8, 1983; 48 FR 29687, June 28, 1983; 54 FR 24333, June 7, 1989; 61 FR 5507, Feb. 13, 1996; 61 FR 9227, March 7, 1996]

