

ENVIRONMENT, SAFETY & HEALTH DIVISION

Chapter 18: [Hearing Conservation](#)

Quick Start Summary

Product ID: [710](#) | Revision ID: 2438 | Date published: 5 August 2021 | Date effective: 5 August 2021

URL: <https://www-group.slac.stanford.edu/esh/eshmanual/references/hearingQuickstart.pdf>

1 Who needs to know about these requirements

The requirements of Hearing Conservation apply to workers, supervisors, area and building managers, the hearing conservation program manager, and Occupational Health. They cover identification of exposed personnel (area and personal monitoring), implementation of noise-reducing engineering and administrative controls, training, medical surveillance, and use of hearing protection.

2 Why

The purpose of these requirements is to protect personnel from hearing loss caused by occupational exposure to excessive noise.

3 What do I need to know

Areas and activities subject to excessive noise must be surveyed (by the hearing conservation program manager). If excessive noise levels are confirmed in an area, the area is designated as a *high noise area* and posted.

Personnel working in a *designated high noise area* or during activities that generate high noise levels must follow requirements, including wearing *hearing protection*. If routinely exposed to high noise levels for an entire shift or eight hours, either because of working in a designated high noise area or because of activities performed, personnel must complete required training and participate in medical surveillance (baseline and annual *audiometric* testing, and follow-up audiometric evaluation or *otological* exam if recommended by Occupational Health).

4 When

These requirements take effect 5 August 2021.

5 Where do I find more information

[SLAC Environment, Safety, and Health Manual](#) (SLAC-I-720-0A29Z-001)

- [Chapter 18, “Hearing Conservation”](#)

Or contact the [program manager](#).

Chapter 18

Hearing Conservation

Product ID: [43](#) | Revision ID: [2437](#) | Date published: 5 August 2021 | Date effective: 5 August 2021

URL: <https://www-group.slac.stanford.edu/esh/eshmanual/pdfs/ESHch18.pdf>

1 Purpose

The purpose of this program is to protect personnel from hearing loss caused by occupational exposure to excessive noise. It covers identification of exposed personnel (area and personal monitoring), implementation of noise-reducing engineering and administrative controls, training, medical surveillance, and use of hearing protection. It applies to workers, supervisors, area and building managers, the hearing conservation program manager, and Occupational Health.

2 Roles and Responsibilities

Functional roles and general responsibilities for each under this program are listed below. More detailed responsibilities and when they apply are provided in the procedures and requirements.

The roles may be performed by one or more individuals and one individual may play more than one role, depending on the structure of the organizations involved. Responsibilities may be delegated.

2.1 Worker

- Notifies supervisor if he or she suspects an area or activity is subject to *high noise levels*
- Contacts the hearing conservation program manager to resurvey an area if there is a change in production, process, equipment, or controls that may increase noise levels
- Follows requirements, including wearing *hearing protection*, whenever working in a *designated high noise area* or during activities that generate high noise levels
- Properly stores hearing protection
- Wears personal noise dosimeter as requested by the hearing conservation program manager

If routinely exposed to high noise levels for an entire shift or eight hours, either because of working in a designated high noise area or because of activities performed:

- Completes required training
- Participates in medical surveillance (baseline and annual *audiometric* testing, and follow-up audiometric evaluation or *otological* exam if recommended by Occupational Health)

2.2 Supervisor

- Ensures the hearing conservation program manager has evaluated his or her work areas and activities for high noise levels, as appropriate
- Forwards noise survey reports and personal dosimetry results to affected personnel
- Contacts the hearing conservation program manager when there is any change in production, process, or equipment that may increase noise levels
- Ensures personnel properly use hearing protection in designated high noise areas and during activities that generate high noise levels
- Assigns required training and medical surveillance to personnel routinely exposed to high noise levels for an entire shift or eight hours, either because of working in designated high noise areas or because of activities performed

2.3 Area / Building Manager

- Ensures that designated high noise areas are clearly posted with warning signs
- Contacts the hearing conservation program manager when there is any a change in production, process, equipment, or controls that may increase noise levels

2.4 Occupational Health Center

- Administers baseline and annual audiometric tests to personnel identified by the hearing conservation program manager (baseline must be completed before personnel start work)
- Maintains records of audiometric tests of all personnel for the duration of their employment
- Notifies personnel when they are overdue for an audiometric test
- Contacts personnel and schedules audiometric tests
- Evaluates the results of the audiometric test and provides them, in writing, directly to personnel tested and their supervisors
- Supplies and fits custom-molded earplugs for personnel who, for medical reasons, cannot use standard, disposable earplugs or earmuffs
- Refers personnel for a clinical audiological evaluation or an otological exam by a specializing physician within 30 days of the detection of a *standard threshold shift* or other abnormal audiometric test result
- Ensures that audiometric equipment is stored, checked, and calibrated properly

2.5 Subcontractor

- Must have and follow their own hearing conservation program in compliance with [8 CCR 5095–5100](#), including providing their own training, medical surveillance, and hearing protection

2.6 Hearing Conservation Program Manager

- Reviews plans for new operations and significant changes to ongoing operations as needed to control noise levels
- Measures and evaluates noise hazards when requested by supervisors or personnel
- Recommends protective measures to minimize exposure of personnel to hazardous noise levels, including evaluating and assisting in noise reduction efforts, effective work practices, and hearing protection selection and usage
- Conducts noise surveys and designates high noise areas
- Conducts personal noise dosimetry
- Recommends designated high noise area warning signs where appropriate
- Notifies supervisors and personnel of noise survey and dosimetry results
- Instructs supervisors to enroll personnel exposed to high noise levels, as confirmed by personal noise dosimetry, in the hearing conservation program by assigning training and medical surveillance
- Maintains noise level meters, dosimeters, and calibration equipment properly
- Maintains noise level survey records, personal notification memos, and equipment calibration logs

3 Procedures, Processes, and Requirements

These documents describe the detailed requirements for this program and how to implement them:

- [Hearing Conservation: Hazard Analysis and Control Procedures](#) (SLAC-I-730-0A09C-013). Describes processes for identifying and evaluating noise hazards and implementing controls
- [Hearing Conservation: Noise Survey Requirements](#) (SLAC-I-730-0A09S-044). Describes requirements for noise surveys
- [Hearing Conservation: Medical Surveillance Requirements](#) (SLAC-I-730-0A09S-045). Describes requirements for baseline and annual audiometric testing

These are the forms and tools for this program:

- [Hearing Conservation: Designated High Noise Area List](#). Lists designated high noise level areas
- [Industrial Hygiene Document Database](#). Database of SLAC industrial hygiene reports

These are other program documents and resources:

- [Hearing Conservation Program Site](#) (SharePoint)

4 Training

4.1 Worker

Personnel exposed to high noise levels routinely for an entire shift or eight hours, either because of working in a designated high noise area or because of activities performed must complete the following:

- ESH Course 222, Hearing Conservation Training ([ESH Course 222](#)) (every 12 months)
- ESH Course 222ME, Hearing Conservation Medical Exam ([ESH Course 222ME](#)) (every 12 months)
- ESH Course 222PRA, Hearing Conservation Practical ([ESH Course 222PRA](#)) (if required by hearing conservation program manager)

Personnel who perform a brief task or job in a designated high noise area are not required to complete hearing conservation training or an audiometric test; however, they must wear hearing protection while they work there.

5 Definitions

audiometer. An instrument for gauging and recording acuity of hearing

audiometric test. A clinical evaluation of a person's hearing capability, using a calibrated pure-tone audiometer and performed in accordance with [8 CCR 5097 \(c\)](#)

decibels-A-weighted scale (dBA). An expression of the relative loudness of sounds in air as perceived by the human ear. In the A-weighted system, the decibel values of sounds at low frequencies are reduced, compared with unweighted decibels, in which no correction is made for audio frequency. This correction is made because the human ear is less sensitive at low audio frequencies, especially below 1000 Hz, than at high audio frequencies

decibels-C-weighted scale (dBC). Unlike dBA, its measurements suit low and high frequency sound levels. The frequency response function, sometimes called a weighting characteristic, controls the tone by giving more weight to some frequencies than other less important frequencies. When transmitted sound has bass issues or problems, the C filter is typically used.

designated high noise area. A work area with an eight-hour TWA of 85 dBA or higher, as surveyed by the hearing conservation program manager

hearing protection/protectors. Devices worn in or on the ears to reduce exposure to noise. May include disposable earplugs, reusable earplugs (banded and corded), and earmuffs.

high noise level. A noise level equal to or greater than 85 dBA. Can be intermittent or continuous noise depending on the noise source.

impact noise. A brief noise caused by colliding objects that occurs at intervals of less than one per second; for example, the noise made by a hammer strike. Personnel must not be exposed to impact noises exceeding 140 decibels dB peak sound pressure without appropriate hearing protection.

noise dosimeter. An instrument that integrates a range of noise levels over a period of time in such a manner that it directly indicates a noise dose

noise reduction rating (NRR). Measure of the estimated attenuation capacity of a hearing protector to represent the approximate noise reduction, in dBA

occupational exposure limit (OEL). A limit for exposure of an employee to a chemical substance or physical agent. OELs are typically set by national agencies and safety and health organizations to prevent adverse health effects from workplace exposures. OELs may be mandatory, as with the *permissible exposure limits (PELs)* set by the Occupational Safety and Health Administration, or recommended, as with *threshold limit values (TLVs)* set by the American Conference of Governmental Industrial Hygienists (ACGIH) or *recommended exposure limits (RELs)* set by the National Institute for Occupational Safety and Health (NIOSH). For occupational noise, the Department of Energy has mandated the use of the TLV as the OEL.

otological. Relating to otology, the branch of medicine that deals with the structure, function, and pathology of the ear

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. Units in decibels (dB).

sound level meter (SLM). A hand-held, direct-reading instrument with a microphone, electronic-filter network, and visual display, such as a meter or digital readout. Because sound level meters provide a real-time indication of noise intensity, they are typically used to survey an area.

standard threshold shift. A change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2,000, 3,000, and 4,000 Hz in either ear

threshold limit value (TLV). Recommended guideline for occupational exposure published by the American Conference of Governmental Industrial Hygienists (ACGIH). TLVs represent the average concentration for an eight-hour workday and a 40-hour workweek to which nearly all workers may be repeatedly exposed without adverse effect. The TLV for noise represents the sound pressure levels and durations of exposure that represent conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse effect on their ability to hear and understand normal speech. The TLV for noise is an eight-hour *time-weighted average* of 85 dBA. (The limit is exceeded when the dose is more than 100 percent as indicated on a dosimeter set with a 3 dB time-intensity exchange and an eight-hour criteria level of 85 dBA.) Exposures greater than this require the use of hearing protection.

time-weighted average sound level (TWA). That sound level, which if constant over an eight-hour exposure, would result in the same noise dose as is measured

6 References

6.1 External Requirements

The following are the external requirements that apply to this program:

- Title 8, *California Code of Regulations*, “Industrial Relations”, Division 1, “Department of Industrial Relations”, Chapter 3.2, “California Occupational Safety and Health Regulations (Cal/OSHA)”,

Subchapter 7, “General Industry Safety Orders”, Group 15, “Occupational Noise”, Article 105, “Control of Noise Exposure” ([8 CCR 5095–5100](#))

- Title 8, *California Code of Regulations*, “Industrial Relations”, Division 1, “Department of Industrial Relations”, Chapter 3.2, “California Occupational Safety and Health Regulations (Cal/OSHA)”, Subchapter 4, “Construction Safety Orders”, Article 3, “General”, Section 1521, “Ear Protection” ([8 CCR 1521](#))
- American Conference of Governmental Industrial Hygienists (ACGIH). Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) ([ACGIH TLVs and BEIs](#))
- American National Standards Institute (ANSI) S3.6, “Specification for Audiometers” ([ANSI S3.6](#))

6.2 Related Documents

[SLAC Environment, Safety, and Health Manual](#) (SLAC-I-720-0A29Z-001)

- [Chapter 19, “Personal Protective Equipment”](#)

Other SLAC Documents

- [SLAC Occupational Health Center](#)
- [Industrial Hygiene Program](#)

Chapter 18: [Hearing Conservation](#)

Hazard Analysis and Control Procedures

Product ID: [711](#) | Revision ID: 2439 | Date published: 5 August 2021 | Date effective: 5 August 2021

URL: <https://www-group.slac.stanford.edu/esh/eshmanual/references/hearingProced.pdf>

1 Purpose

The purpose of these procedures is to protect personnel from hearing loss caused by occupational exposure to excessive noise. They cover identifying and evaluating noise hazards and implementing controls. They apply to workers, supervisors, area and building managers, the hearing conservation program manager, and Occupational Health.

1.1 Standards for Occupational Noise Exposure

For occupational noise, the Department of Energy has mandated the use of the ACGIH *threshold limit value (TLV)* as the *occupational exposure limit (OEL)*.¹ The TLV for noise is defined as an eight-hour *time-weighted average (TWA)* of 85 dBA (*decibels A-weighted scale*).² This means that in an area where the intensity of noise exceeds an average of 85 dBA over eight hours, the amount of time workers may work in the area, without *hearing protection*, must be reduced in relation to the amount that the noise exceeds 85 dBA, as shown in Table 1.

Table 1 Maximum Number of Hours of Exposure Allowed (includes impact noise)

Noise Level (dBA)	Duration (Hours)
80	24
82	16
85	8
88	4
91	2
94	1
97	0.5
100	0.25
103	0.125

- 1 The American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) ([ACGIH TLVs and BEIs](#))
- 2 The limit is exceeded when the dose is more than 100 percent as indicated on a dosimeter set with a 3 dB time-intensity exchange rate and an eight-hour criteria level of 85 dBA.

For example, if the noise in an area is measured at an average of 88 dBA over an eight-hour period, personnel may only work in that area without wearing hearing protection for a maximum of four hours. If the noise does not exceed an average of 85 dBA over an eight-hour period, personnel may work a full eight-hour shift without wearing hearing protection.

2 Procedures

The hearing conservation program reduces potential noise exposure to acceptable levels by

- Anticipating, recognizing, and evaluating noise hazards before they exist
- Surveying hazards that already exist
- Implementing recommended engineering controls where feasible (reducing machine noise using dampeners, insulation, isolation, distance)
- Implementing administrative controls (wearing hearing protection, limiting exposure time, training, medical surveillance) when engineering controls are not feasible

2.1 Design Review

New projects involving machinery and other high noise-producing equipment are submitted to the hearing conservation program manager for evaluation as part of ESH project review (see [General Policy and Responsibilities: ESH Project Review Procedure](#)). The hearing conservation program manager identifies any areas of concern, provides comments and recommendations for safe use, and may require noise level monitoring before equipment is used by personnel.

2.2 Identifying and Working in High Noise Areas

Areas where noise levels may be *high* (at or above 85 dBA as continuous noise or for eight hours or an entire shift) must be identified, evaluated, and, if confirmed to have high noise levels, posted. Workers in such areas must wear hearing protection and must be evaluated for enrollment in the hearing conservation program (see Section 2.3).

Step	Person	Action
1.	Worker/supervisor/area or building manager	Requests a noise survey (by contacting the hearing conservation program manager) when any of these conditions apply: <ul style="list-style-type: none">▪ It is difficult to hear someone speak when they are less than three feet away.▪ You must raise your voice considerably to be heard due to noise interference.▪ Impact noises (at intervals greater than 1 second) cause discomfort when heard.▪ Ordinary noises sound muffled to you after you have finished a work shift.
2.	Hearing conservation program manager	If the noise is area specific, <ul style="list-style-type: none">▪ Conducts a noise survey of the area (following Hearing Conservation: Noise Survey Requirements)

Step	Person	Action
		If the noise is activity specific, <ul style="list-style-type: none"> Arranges for personal noise dosimetry for a representative, affected worker (see Section 2.3)
3.	Hearing conservation program manager	If the survey indicates continuous noise levels at or above 85 dBA for eight hours or an entire shift or periodic impact noise of 140 dB or higher: <ul style="list-style-type: none"> Designates the area a <i>high noise area</i> and adds it to the designated high noise area list (Hearing Conservation: Designated High Noise Area List) Notifies the area/building manager, recommending appropriate hearing protection (see Section 2.4) Arranges for personal noise dosimetry for a representative, affected worker (see Section 2.3)
4.	Area/building manager	If notified that the area is a high noise area: <ul style="list-style-type: none"> Posts an effective hazard warning sign at all entrances to the area. The sign must clearly state the noise hazard and requirements of the area. (See Section 2.2.1.)
5.	Worker	Follows posted requirements, including wearing hearing protection, whenever working in a designated high noise area (and wears hearing protection during activities that generate high noise levels)
6.	Worker/supervisor/area or building manager	Contacts the hearing conservation program manager to resurvey the area if there is a change in production, process, equipment, or controls that may increase noise levels

2.2.1 Posting Requirements

The area/building manager must post an effective hazard warning sign at all entrances to a designated high noise area. The sign must clearly state the noise hazard and requirements of the area. See Figure 1 for an example.



Figure 1 Sample Designated High Noise Area Warning Sign

2.3 Enrolling Workers in the Hearing Conservation Program

Workers who may be exposed to high noise levels routinely for an entire shift or eight hours, either because they work in high noise areas or because of activities they perform, are subject to personal noise dosimetry (that is, wearing a personal noise dosimeter for a shift to measure their noise exposure during that time). If the dosimetry indicates a high average noise level (at or above 85 dBA for eight hours or an entire shift), the person must be enrolled in the hearing conservation program, which entails training and medical surveillance. Other affected workers, routinely working in the same area or performing the same activities, must also be enrolled in the program. Dosimetry for each individual is not necessary.

Workers who perform brief tasks or jobs while exposed to high noise levels are not required to enroll in the program; however, they must wear hearing protection.

Step	Person	Action
1.	Hearing conservation program manager	If a noise survey indicates continuous noise levels at or above 85 dBA for eight hours or an entire shift in an area or an activity is suspected of exposing a worker to such noise levels <ul style="list-style-type: none"> ▪ Arranges for personal noise dosimetry (following Hearing Conservation: Noise Survey Requirements)
2.	Worker	Wears personal noise dosimeter for a full shift, as directed by the hearing conservation program manager
3.	Hearing conservation program manager	Observes and records general information about personnel work processes
4.	Hearing conservation program manager	Retrieves dosimetry, records readings
5.	Hearing conservation program manager	Develops a personal notification memo and sends it in a timely manner directly to the person who wore the dosimeter, his or her supervisor, the area/building manager, and the ESH coordinator
6.	Hearing conservation program manager	If the dosimetry indicates a high average noise level (at or above 85 dBA for eight hours or an entire shift) <ul style="list-style-type: none"> ▪ Instructs supervisors to enroll personnel in the hearing conservation program by assigning training and medical surveillance
7.	Supervisor	Assigns required training (ESH Course 222) and medical surveillance (ESH Course 222ME) to all affected personnel (both the person who wore the dosimeter and others who work in the same area or perform the same activities)
8.	Worker	Completes required training (ESH Course 222)
9.	Occupational Health	Conducts baseline and annual audiometric testing (ESH Course 222ME) (see Hearing Conservation: Medical Surveillance Requirements)
10.	Worker	Participates in baseline and annual audiometric testing
11.	Worker	Properly uses hearing protection in designated high noise areas and during activities that generate high noise levels

2.4 Personal Protective Equipment – Hearing Protection

Hearing protection is **recommended** anytime personnel are exposed to noise levels at or above 85 dBA, irrespective of the duration of exposure. As appropriate, and in compliance with the TLV, a reduction in standard area hearing protection requirements may be made by the program manager for passersby or others in high noise areas based on the duration of the time in the noisy area.

Hearing protection is **required** if there is the potential to be exposed in excess of the TLV (85 dBA for an eight-hour TWA). Appropriate hearing protection must be chosen that reduces the exposure to less than 100 percent of the TLV.

Personnel who work in designated high noise areas must be provided with and wear appropriate personal hearing protectors when equipment is operating. The protection must reduce noise exposure to acceptable levels (below 85 dBA or 140 dB for impact noise). In some areas, dual hearing protection (such as ear muffs and earplugs) is necessary to sufficiently reduce exposure to meet this criterion.

Hearing protectors have a *noise reduction rating (NRR)* number as specified by the manufacturer on the packaging. The NRR is a general guide to the level of noise reduction (in decibels) the protector provides in laboratory test situations if it is fitted and worn properly.

To determine the effective noise reduction of a hearing protector used in the workplace, subtract 7 dB from the NRR, if using the A-weighted sound data.

For dual protection, such as ear muffs and earplugs worn simultaneously:

Check the NRR between muff and plugs and use the highest one

- If using the A-weighted sound level data, correct the above NRR by subtracting 7 dB
- For adding the remaining and less effective NRR, simply add the arbitrary value of 5 dB

Personnel must follow manufacturers' instructions for cleaning, wearing and storing hearing protectors.

[Occupational Health](#) will supply and fit custom-molded earplugs for personnel who, for medical reasons, cannot use standard, disposable earplugs or earmuffs.

3 Forms

The following forms and systems are required by these procedures:

- [Hearing Conservation: Designated High Noise Area List](#). Lists designated high noise level areas
- [Industrial Hygiene Document Database](#). Database of SLAC industrial hygiene reports

4 Recordkeeping

The following recordkeeping requirements apply for these procedures:

- The hearing conservation program manager maintains a list of designated high noise areas ([Hearing Conservation: Designated High Noise Area List](#)).

- The hearing conservation program manager maintains noise level survey records and personal notification memos (in the [Industrial Hygiene Document Database](#)).

5 References

[SLAC Environment, Safety, and Health Manual](#) (SLAC-I-720-0A29Z-001)

- [Chapter 18, “Hearing Conservation”](#)
 - [Hearing Conservation: Noise Survey Requirements](#) (SLAC-I-730-0A09S-044). Describes requirements for noise surveys
 - [Hearing Conservation: Medical Surveillance Requirements](#) (SLAC-I-730-0A09S-045). Describes requirements for baseline and annual audiometric testing
 - [Hearing Conservation Program Site](#) (SharePoint)
- [Chapter 1, “General Policy and Responsibilities”](#)
 - [General Policy and Responsibilities: ESH Project Review Procedure](#) (SLAC-I-720-0A24C-001)

Other SLAC Documents

- ESH Course 222, Hearing Conservation Training ([ESH Course 222](#))
- ESH Course 222ME, Hearing Conservation Medical Exam ([ESH Course 222ME](#))
- [SLAC Occupational Health Center](#)

Other Documents

- Title 8, *California Code of Regulations*, “Industrial Relations”, Division 1, “Department of Industrial Relations”, Chapter 3.2, “California Occupational Safety and Health Regulations (Cal/OSHA)”, Subchapter 7, “General Industry Safety Orders”, Group 15, “Occupational Noise”, Article 105, “Control of Noise Exposure” ([8 CCR 5095–5100](#))
- Title 8, *California Code of Regulations*, “Industrial Relations”, Division 1, “Department of Industrial Relations”, Chapter 3.2, “California Occupational Safety and Health Regulations (Cal/OSHA)”, Subchapter 4, “Construction Safety Orders”, Article 3, “General”, Section 1521, “Ear Protection” ([8 CCR 1521](#))
- American Conference of Governmental Industrial Hygienists (ACGIH). Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) ([ACGIH TLVs and BEIs](#))

Chapter 18: [Hearing Conservation](#)

Noise Survey Requirements

Product ID: [712](#) | Revision ID: 2440 | Date published: 5 August 2021 | Date effective: 5 August 2021

URL: <https://www-group.slac.stanford.edu/esh/eshmanual/references/hearingReqSurvey.pdf>

1 Purpose

The purpose of these requirements is to protect personnel from hearing loss caused by occupational exposure to excessive noise. They cover noise surveys. They apply to supervisors and the hearing conservation program manager.

2 Requirements

2.1 General

The hearing conservation program manager performs baseline noise surveys and periodic resurveys of work areas and operations as needed to identify and evaluate high noise areas and activities.

The results of the surveys are used to implement controls, including designating *high noise areas*, requiring the use of *hearing protection* personal protective equipment (PPE), and requiring training and medical surveillance (that is, enrolling personnel in the hearing conservation program). (See [Hearing Conservation: Hazard Analysis and Control Procedures](#).)

Surveys may include sound level measurement in the general work area as well as personal *noise dosimetry*.

Surveys may be performed by a qualified technician, but the process must be overseen by an ESH Division industrial hygienist.

The hearing conservation program manager conducts monitoring according to guidelines published by the American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) ([ACGIH TLVs and BEIs](#)) with equipment maintained and calibrated according to manufacturers' recommendations.

2.2 Personal Noise Dosimetry

Personal noise dosimetry is used to measure exposure of individuals to noise levels through the work day. Noise levels surrounding the individual are measured and recorded over an eight-hour period (or for the full work shift). General information about work processes is also observed and recorded.

The hearing conservation program manager then develops a personal notification memo detailing the results of the dosimetry and sends it in a timely manner to the affected persons.

2.3 Area Noise Level Monitoring

Noise levels in a general work area are measured and recorded to determine the extent of noise exposure or to measure the effectiveness of engineering controls applied to a machine (such as dampeners, insulation, isolation, distance).

The survey is conducted by placing a sound level meter in a fixed location in the work area or near the source of the noise.

After performing the survey, the hearing conservation program manager must write a detailed report that

- Describes the tasks and locations where the noise survey occurred
- Identifies workers monitored or represented by the survey
- Describes control measures in place during the survey (including the use of hearing protectors)
- Notes any factors that may have affected noise data recorded (if applicable)
- Provides an interpretation of the results

If applicable, recommendations to reduce potential or actual exposures and requirements for completing training and medical surveillance will be included in the report.

The hearing conservation program manager sends the report to the supervisor of the area. The supervisor is responsible for distributing the report to affected personnel in a timely manner.

2.4 Noise Survey Equipment

Noise survey equipment must be maintained, serviced, and calibrated according to manufacturer recommendations. Equipment must be sent out for factory service and calibration at a frequency established by the manufacturer. Dosimeters and *sound level meters* are also checked for accurate calibration on-site by the industrial hygienist or technician before and after each use.

The equipment must be marked with a sticker or tag indicating the most recent calibration date or the date when calibration is due again. Before- and after-use calibrations by the hearing conservation program manager need not be marked on the unit.

Equipment that is broken, inaccurate, or past-due for calibration may not be used until repaired or recalibrated.

Equipment must be properly stored in a secured, clean location, away from light, dust, and other contaminants.

3 Forms

The following forms and systems are required by these requirements:

- [Industrial Hygiene Document Database](#). Database of SLAC industrial hygiene reports

4 Recordkeeping

The following recordkeeping requirements apply for these requirements:

- The hearing conservation program manager maintains paper copies of noise survey reports and personal notification memos for a minimum of two years (and electronic versions in the [Industrial Hygiene Document Database](#)).
- The hearing conservation program manager maintains an equipment calibration inventory, identifying all hearing conservation program-owned noise survey equipment, the date of most recent calibration, and the next calibration due date.

5 References

[SLAC Environment, Safety, and Health Manual](#) (SLAC-I-720-0A29Z-001)

- [Chapter 18, “Hearing Conservation”](#)
 - [Hearing Conservation: Hazard Analysis and Control Procedures](#) (SLAC-I-730-0A09C-013). Describes processes for identifying and evaluating noise hazards and implementing controls
 - [Hearing Conservation: Designated High Noise Area List](#). Lists designated high noise level areas
 - [Hearing Conservation Program Site](#) (SharePoint)

Other SLAC Documents

- [Industrial Hygiene Program](#)

Other Documents

- Title 8, *California Code of Regulations*, “Industrial Relations”, Division 1, “Department of Industrial Relations”, Chapter 3.2, “California Occupational Safety and Health Regulations (Cal/OSHA)”, Subchapter 7, “General Industry Safety Orders”, Group 15, “Occupational Noise”, Article 105, “Control of Noise Exposure” ([8 CCR 5095–5100](#))
- American Conference of Governmental Industrial Hygienists (ACGIH). Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) ([ACGIH TLVs and BEIs](#))

Chapter 18: [Hearing Conservation](#)

Medical Surveillance Requirements

Product ID: [713](#) | Revision ID: 2441 | Date published: 5 August 2021 | Date effective: 5 August 2021

URL: <https://www-group.slac.stanford.edu/esh/eshmanual/references/hearingReqMedical.pdf>

1 Purpose

The purpose of these requirements is to protect personnel from hearing loss caused by occupational exposure to excessive noise. They cover baseline and annual audiometric testing. They apply to workers, supervisors, the hearing conservation program manager, and Occupational Health.

2 Requirements

2.1 General

Personnel who routinely work in *designated high noise areas* must undergo baseline and annual *audiometric* tests. (Personnel who perform a brief task or job in a designated high noise area are not required to take an audiometric test; however, they must wear hearing protection while they work there.) (See [Hearing Conservation: Hazard Analysis and Control Procedures](#).)

The hearing conservation program manager may also recommend medical surveillance for personnel when a survey indicates a potential over-exposure to *high noise levels*. This recommendation is provided in writing to personnel and their supervisors, usually within the contents of a noise survey report or personal notification memo resulting from personal noise dosimetry.

Supervisors are responsible for enrolling personnel by assigning ESH Course 222ME, Hearing Conservation Medical Exam ([ESH Course 222ME](#)).

Personnel are responsible for participating in the tests. Before tests, personnel must avoid noisy environments (or properly wear hearing protectors) for 14 hours.

[Occupational Health](#) performs all required audiometric tests, at no cost to personnel. Audiometric testing must meet the requirements of [8 CCR 5097 \(c\)](#). Occupational Health

- Administers baseline and annual audiometric tests to personnel identified by the hearing conservation program manager (baseline must be completed before personnel start work)
- Maintains records of audiometric tests of all personnel for the duration of the person's employment
- Notifies personnel when they are overdue for an audiometric test
- Contacts personnel and schedules audiometric tests
- Evaluates the results of the audiometric test and provides them, in writing, directly to personnel tested and their supervisors

- Supplies and fits custom-molded earplugs for personnel who, for medical reasons, cannot use standard, disposable earplugs or earmuffs
- Refers personnel for a clinical audiological evaluation or an otological exam by a specializing physician within 30 days of the detection of a *standard threshold shift* or other abnormal audiometric test result

2.2 Audiometric Testing Equipment

In accordance with [8 CCR 5097 \(f\)](#), the audiometric testing equipment must be

- Checked before each day's use
- Acoustically calibrated at least annually
- Fully calibrated at least every two years

The equipment must be marked with a sticker or tag indicating the most recent calibration date, the type of calibration, and when calibration is due again. Before-use calibrations by Occupational Health Center staff need not be marked on the unit.

Equipment that is broken, inaccurate, or past-due for calibration must be tagged out of service until repaired or recalibrated. The tag should provide the date, the person's name, reason the unit was taken out of service, and the planned disposition of the unit.

Equipment must be properly stored in a secured, clean location, away from light, dust, and other contaminants.

3 Forms

The following forms and systems are required by these requirements:

- None

4 Recordkeeping

The following recordkeeping requirements apply for these requirements:

- Occupational Health maintains paper copies of audiometric test results for the duration of the affected person's employment.
- Occupational Health is responsible for tracking the calibration dates and service records (as needed) of audiometric testing equipment.

5 References

[SLAC Environment, Safety, and Health Manual](#) (SLAC-I-720-0A29Z-001)

- [Chapter 18, "Hearing Conservation"](#)

- [Hearing Conservation: Hazard Analysis and Control Procedures](#) (SLAC-I-730-0A09C-013).
Describes processes for identifying and evaluating noise hazards and implementing controls
- [Hearing Conservation Program Site](#) (SharePoint)

Other SLAC Documents

- ESH Course 222ME, Hearing Conservation Medical Exam ([ESH Course 222ME](#))
- [SLAC Occupational Health Center](#)

Other Documents

- Title 8, *California Code of Regulations*, “Industrial Relations”, Division 1, “Department of Industrial Relations”, Chapter 3.2, “California Occupational Safety and Health Regulations (Cal/OSHA)”, Subchapter 7, “General Industry Safety Orders”, Group 15, “Occupational Noise”, Article 105, “Control of Noise Exposure” ([8 CCR 5095–5100](#))
- American National Standards Institute (ANSI) S3.6, “Specification for Audiometers” ([ANSI S3.6](#))