

C-9 HEARING CONSERVATION AND NOISE CONTROL

I. PURPOSE

This program ensures hearing conservation and noise control efforts in areas where employee exposure to noise equals or exceeds levels set forth in the *Occupational Noise Exposure Standard* (29 CFR 1910.95). To reduce occupational hearing loss, employees enrolled in the NCI-Frederick Hearing Conservation Program (HCP) are provided hearing protection, annual training, and hearing tests.

II. DEFINITIONS

Action Level - A sound level equaling an 8-hour TWA of 85 dBA, or equivalently a noise dose of fifty percent, as specified in 29 CFR 1910.95.

Audiogram – A chart, graph or table that results from an audiometric test. An audiogram shows an individual's hearing threshold level as a function of frequency (Hz).

Baseline Audiogram - The baseline audiogram is the reference audiogram against which future audiograms are compared.

dBA: Decibels on an A-weighted level - A measurement of noise intensity obtained using a sound measuring instrument; commonly used to define degrees of auditory risk. The A-weighting is a measurement that closely parallels the auditory characteristics of normal human hearing.

Dosimetry – A technique of sound measurement that integrates cumulative noise exposure over time and directly indicates a noise dose.

Hearing Conservation Program (HCP) - An annual audiometric testing and hearing conservation training program for employees exposed to sound levels equaling or exceeding the action level.

Hearing Protection Device (HPD) - Personal protective equipment worn by an individual for the purpose of reducing noise exposure including reusable and disposable earplugs, ear muffs, and similar noise attenuating devices.

Standard Threshold Shift (STS) - A change in hearing threshold, relative to the baseline audiogram, of an average of 10 decibels or more at 2000, 3000, and 4000 Hz in either ear, taking into account any changes due to presbycusis (age-related hearing loss).

Time Weighted Average (TWA) - Noise exposure averaged over a designated period of time. (Example: 8-hour TWA)

III. **RESPONSIBILITIES**

A. Environment, Health and Safety Program (EHS)

1. Administers the NCI-Frederick Hearing Conservation program.
2. Conducts and documents noise surveys periodically or when changes occur that would alter noise levels.
3. Identifies noise hazard areas and posts appropriate signs.
4. Provides employees access to noise survey and dosimetry records.
5. Notifies Occupational Health Services, Supervisor and affected employees when monitoring indicates an exposure at or above OSHA's Action Level, and participation in the HCP becomes mandatory.
6. Recommends appropriate engineering and/or administrative noise controls.
7. Develops a training program and ensures annual training of employees enrolled in the HCP in hearing conservation issues and practices.
8. Maintains sound level meters, noise dosimeters, and field calibration equipment in accordance with manufacturer's instructions and performs or provides for required calibrations in accordance with the requirements of 29 CFR 1910.95.
9. Maintains records of all noise monitoring and instrument calibration.

B. Occupational Health Services (OHS)

1. Conducts baseline audiograms and annual audiometric testing on employees enrolled in the HCP in accordance with the specifications of 29 CFR 1910.95.
2. Notifies EHS of employee complaints of potential noise hazard exposures.

3. Ensures the proper selection and fit of HPD's.
4. Ensures appropriate certification of those responsible for audiometric testing, interpretation of audiometric results, selection and fit of HPD's, and employee hearing conservation training.
5. Identifies Standard Threshold Shift (STS), subsequent re-testing, employee notification, management of those employees with STS, and possible referrals.
6. Assists EHS as needed with the annual training of employees in the HCP.
7. Maintains audiometric testing equipment in accordance with manufacturer's instructions and performs or provides for required machine calibrations in accordance with the requirements of 29 CFR 1910.95, Appendix E.
8. Maintains records of audiometric test results (audiograms), employee training, and of noise monitoring results for duration of employment plus 30 years.

C. Supervisor

1. Notifies Environment, Health and Safety Program (EHS) of potential noise hazard areas.
2. Evaluates the feasibility of engineering and/or administrative noise controls as recommended by EHS.
3. Identifies employees exposed to sound levels equaling or exceeding the action level to EHS.
4. Ensures the ready availability of appropriate Hearing Protection Devices (HPD's) to employees working in identified noise hazard areas.
5. Enforces the proper use of HPD's.

D. Employee

1. Wears HPD's when entering or working in identified noise hazard areas in accordance with the posted warning.
2. Reports potential noise hazard exposures to Supervisor, EHS, or OHS.
3. Complies with Hearing Conservation Program requirements when identified as being exposed to sound levels equaling or exceeding the action level.

IV. **PROGRAM ELEMENTS**

A. Noise Monitoring

1. Noise level surveys of potential noise hazard areas shall be conducted periodically.
2. When area surveys are inappropriate for determining an employee's actual noise exposure due to circumstances such as high mobility, significant variations in sound level, or a significant component of impulse noise, personal noise dosimetry shall be conducted to comply with monitoring requirements.
3. Employees identified as being exposed at or above an 8-hour time weighted average of 85 decibels shall be notified with the results of the monitoring, and shall be required to enroll in the NCI-Frederick Hearing Conservation Program.
4. Caution signs that clearly indicate a hazard of high noise levels and the recommendations/requirements to wear HPD's shall be posted at entrance(s) to, and the periphery of, noise hazard areas. In areas where work is sporadic (i.e. attics and basements), warning signs shall be posted with a reference duration so as not to exceed an 8-hour time weighted average of 85 decibels.
5. Noise dosimetry and area monitoring will be repeated periodically, or whenever any changes to facilities, equipment, work practices, procedures, or noise-control measures alter potential noise exposures.
6. Instruments used to determine sound levels will be calibrated as specified in 29 CFR 1910.95 (Appendix G) and will meet or exceed

the performance requirements specified in 29 CFR 1910.95 and ANSI S1.4, *Specification for Personal Noise Dosimeters* (latest revision).

- B. Engineering Controls - EHS recommends the use of engineering controls as the primary mechanism to attenuate noise emission. Engineering controls must meet the technical and economic feasibility criteria of the Occupational Safety and Health Administration (OSHA).
- C. Administrative Controls - When engineering controls are not feasible, or fail to reduce sound levels, EHS recommends administrative controls to limit the amount of time that an employee works in areas where the 8-hour TWA equals or exceeds 90 dBA. A written plan of employee rotation or scheduling of equipment operation shall be utilized.
- D. Personal Protective Equipment – HPD's are provided and must be used when feasible engineering and administrative controls fail to reduce sound levels to those specified by 29 CFR 1910.95.

The following guidelines for personal protection apply:

1. HPD's will be available and recommended to be worn by all employees when working in areas where sound levels equal or exceed the action level.
2. Employees will be required to wear HPD's when working in areas where their anticipated 8-hour TWA sound level would equal or exceed 90 dBA.
3. Employees with an STS will wear HPD's during the entire work shift when working in areas where the 8-hour TWA sound level equals or exceed 90 dBA.
4. The employee's supervisor will enforce the proper use of HPD's.
5. Several types of HPD's will be made available to employees, thus allowing for personal preference, proper attenuation, and proper fit.
6. All persons entering posted noise hazard areas are to wear HPD's in accordance with the posted warning.

- E. Audiometric Testing - The important elements of an audiometric testing program include baseline audiograms, annual audiograms, training, and follow-up procedures.
1. All audiometric testing shall meet the requirements stated in 29CFR 1910.95(h). This includes calibration of the audiometer in accordance with the requirements of 29 CFR 1910.95 (Appendix E) and American National Standard (ANSI) S3.6, *Specification for Audiometers* (latest revision). The audiometer shall also meet the specifications of, and be maintained and used in accordance with 29 CFR 1910.95 and ANSI S3.6 (latest revision). The audiometric booth and/or room used for testing shall meet the requirements specified by 29 CFR 1910.95, Appendix D.
 2. Occupational Health Services (OHS) will provide baseline audiometric testing for all new employees within 6 months of an employee's first exposure at or above an 8-hour TWA of 85 dB.
 3. Audiometric testing for those employees enrolled in the HCP shall be conducted at least annually. Annual audiograms shall be compared to baseline audiograms to determine if there is a Standard Threshold Shift.
 4. If a Standard Threshold Shift (STS) is identified:
 - a. A retest shall be conducted within 30 days to determine if the shift is temporary or permanent.
 - b. OHS shall notify the employee in writing of the audiometric testing results within 21 days of determination.
 - c. Employees shall be fitted or refitted with adequate hearing protectors, shown how to use them, and required to wear them.
 - d. The employee shall be referred for further testing when test results are questionable or when problems of a medical nature are suspected.
 5. Training - Employees exposed to TWAs of 85 dB and above shall be trained at least annually in the effects of noise; the purpose, advantages, and disadvantages of various types of hearing protectors; the selection, fit, and care of protectors; and the purpose and procedures of audiometric testing.

6. Follow-up audiometric testing shall be conducted as necessary to ensure that the NCI-Frederick Hearing Conservation Program is preventing hearing loss.
- F. Recordkeeping - EHS shall retain noise measurement records for at least 2 years. OHS shall maintain records of audiometric test results, training, and the employee's most recent noise exposure assessment for the duration of the affected employee's employment, plus 30 years.
- G. Program Evaluation – EHS and OHS will annually review and revise, if necessary, the NCI-Frederick Hearing Conservation Program. Evaluation will include, but is not limited to: noise level surveys results, individual noise exposure risk assessments, audiometric monitoring records, training logs, equipment calibration records, records of disposition and follow-up actions, clinical records, and documents reflecting work-site inspections of employees enrolled in the HCP. Any necessary changes shall be made to the HCP at this time.

V. **REFERENCES**

- A. American National Standards Institute, New York. Standards:
 - Specification for Personal Noise Dosimeters, ANSI S1.4
 - Specification for Audiometers, ANSI S3.6
- B. Occupational Safety and Health Administration, Washington DC.
 - Occupational Noise Exposure Standard, 29 CFR 1910.95
 - OSHA 3074: Hearing Conservation