Hearing Conservation Standards & Regulations

OSHA Noise Standard

- Standard number 29 CFR 1910.95
  - 29 designates Dept of Labor
  - Code of Federal Regulations (CFR)
- Occupational Noise Exposure
  - Non-occupational noise not regulated
- Covers general industry
  - Not construction, agriculture, mining

OSHA Noise Standard

29 CFR 1910.95

- Since 1971
- Employers must
  - (a) Limit employee noise exposures to PEL or below
  - (b) Use feasible noise controls whenever employee exposures are above PEL
    - Personal Protective Equipment (PPE) may be used to supplement noise controls
  - (c) Administer a “continuing, effective hearing conservation program”

Noise Exposure Limits

29 CFR 1910.95(b)

- PEL = 90 dBA TWA (8 hours)
  - 5 dB lower PEL for workers with STS
    - Standard Threshold Shift
- Table G-16

Duration per day	Sound level dBA
10 hours	88.75 dB TWA
8 hours	**90 dB TWA**
6 hours	92 dB TWA
4 hours	**95 dB TWA**
2 hours	100 dB TWA
1 hour	105 dB TWA
1/2 hour	110 dB TWA
1/4 hour or less	115 dB TWA

Engineering Noise Controls

- Eliminate or minimize the hazard
- Buy quiet equipment
- Noise controls
  - Material damping
  - Modify equipment speed, pressure
- Noise barriers
  - Block noise path before noise reaches people
  - Enclosures
  - Sound absorbing materials

Administrative Noise Controls

- Move people away from noise source
- Limit time of workers in noisy areas

Personal Protective Equipment

- Hearing Protection Devices (HPDs)
- Last line of defense
  - Engineering & administrative controls not always feasible
  - Noise controls may not reduce exposure enough
- OSHA enforcement policy
  - PPE is an acceptable substitute for noise controls up to 100 dBA TWA

Hearing Conservation Amendment 29 CFR 1910.95

- Since 1983
- "Action Level" is 85 dBA TWA
  - Employer must provide Hearing Conservation Program
    - Noise monitoring
    - Annual hearing testing
    - Provide hearing protectors
    - Annual training
    - Record keeping

Noise Monitoring

29 CFR 1910.95 (d)

- Purpose
  - Identify employees to include in HCP
  - Enable proper selection of hearing protectors
- Measure all continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels

Exposure Monitoring
29 CFR 1910.95 (d)

- Use “representative personal sampling” (dosimetry) when
  - employees are mobile
  - noise is highly variable or
  - impulse noise is significant

Exposure Monitoring
29 CFR 1910.95 (d)

- Repeat whenever a change in production, process, equipment or controls increases noise exposures to the extent that:
  - Additional employees may be exposed at or above the action level; or
  - The attenuation provided by hearing protectors being used by employees may be rendered inadequate

Audiometric Testing
29 CFR 1910.95 (g)(1)(2)

- Provide audiometric testing program to all employees exposed at or above the Action Level
- Program provided at no cost to employees

Audiometric Testing

29 CFR 1910.95 (g)(3)

- Test must be performed by a qualified person
  - Licensed or certified audiologist, or
  - Otolaryngologist (ENT) or other physician, or
  - Technician who is either:
    - Certified by CAOHC, or
    - Competent to administer audiometric exams, obtain valid audiograms, and properly use, maintain & calibrate audiometric equipment
  - OHC must be "responsible to" an audiologist, otolaryngologist or physician

Audiometric Testing

29 CFR 1910.95 (g)(5)

- Employer must measure "baseline" audiogram within 6 months of employees first exposure over the action level
- Mobile test van exception
  - Employer has 1 year to obtain baseline audiogram
  - Employees exposed over action level must wear hearing protectors for any period exceeding six months after first exposure until the baseline audiogram is obtained

Audiometric Testing

29 CFR 1910.95 (g)(5)

- No workplace noise exposure for 14 hours before baseline hearing test
- Hearing protection can be substituted for quiet
- Notify employee to avoid non-workplace noise for 14 hrs.

Audiometric Testing

29 CFR 1910.95 (g)(7)

- Evaluation of audiogram
  - Compare annual audiogram to baseline audiogram
    - to determine if the audiogram is valid and
    - if a Standard Threshold Shift (STS) has occurred.
  - *This may be done by the OHC*

OSHA Standard Threshold Shift

29 CFR 1910.95 (g)(7)

- On an annual audiogram, an average shift from baseline of 10 dB or more at the audiometric frequencies 2000, 3000, and 4000 Hz in either ear

Audiometric Testing

29 CFR 1910.95 (g)(7)

- "Problem audiograms" must be reviewed by audiologist, ENT, or physician
  - Determine need for further evaluation
- Employer must provide evaluator:
  - Baseline and most recent audiogram
  - Audiometer calibration records
  - Measurements of background noise levels in audiometric test room
  - Copy of 29 CFR 1910.95

Audiometric Testing

29 CFR 1910.95 (g)(7)

- If STS has occurred:
  - Employer may retest within 30 days and consider the results of the retest as the annual audiogram

Audiometric Testing

29 CFR 1910.95 (g)(8)

- Follow-up procedures if HL is work related
  - Inform employee of STS in writing, within 21 days
  - Fit employees who don't wear HPDs with protectors, train them how to properly wear them and require them to do so
  - Re-fit and re-train employees who are using HPDs and provide higher attenuation devices, if needed
  - Refer employee for audiology or otology evaluation, as needed

Audiometric Testing

29 CFR 1910.95 (g)(8)

- Follow-up procedures
  - If future test indicates STS is not persistent, the employer:
    - Must notify employee of new interpretation, and
    - May discontinue the required use of hearing protection

Audiometric Testing
29 CFR 1910.95 (g)(9)

- Revised baseline
  - Employer may substitute annual audiogram for baseline audiogram
  - Decision made by audiologist or physician
  - Reasons to revise:
    - STS is persistent
    - Hearing threshold in annual audiogram is improved compared to baseline

Audiometric Testing
29 CFR 1910.95 (h)

- Test each ear individually at 6 frequencies
  - 500 Hz
  - 1000 Hz
  - 2000 Hz
  - 3000 Hz
  - 4000 Hz
  - 6000 Hz
- Test room noise must not exceed limits
  - Appendix D

Audiometric Testing
29 CFR 1910.95 (h)

- Audiometers must meet ANSI requirements
- Equipment calibration requirements
  - Daily calibration “check”
  - Acoustic calibration annually
  - Exhaustive calibration every 2 years

Audiometric Testing

29 CFR 1910.95 Appendix F

- Age correction
  - Employers may adjust hearing levels measure in most recent audiogram to account for age-related hearing loss
  - Not mandatory

Hearing Protectors

29 CFR 1910.95(i)

- Available to all employees exposed at or above action level
  - No cost to employees
  - Replaced "as necessary"
- "Suitable variety" must be provided
  - At least 1 type of plug and 1 type of muff
- Employer must:
  - Provide training on use and care
  - Ensure proper initial fitting and supervise correct use

HPD Attenuation

29 CFR 1910.95 (i)

- Employer must evaluate the adequacy of hearing protector noise reduction (attenuation)
  - Use one of several methods in Appendix B
  - *NOTE: OSHA enforcement policy differs from standard (more later)*
- Bottom line: HPD must lower exposure to 90 dBA TWA or less
  - For employees who have had STS, the HPD must lower exposure to 85 dBA TWA or less

Training Program

29 CFR 1910.95(k)

- Annual training for all employees who are in the HC program
- Mandatory elements of training
  - The effects of noise on hearing
  - Purpose of hearing protection device (HPD)
  - Proper selection, fitting, use & care of HPDs
  - Advantages & disadvantages of each type of HPD
  - The purpose of audiometric testing, and an explanation of the test procedures.

Recordkeeping

29 CFR 1910.95 (m)

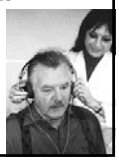
- Keep records of:
  - Exposure measurements (2 years)
  - Audiometric tests (duration of employment)
- Access to records
  - Provided upon request to employees, former employees, representatives designated by the individual employee, OSHA.

OSHA Rules for Recording Hearing Loss

29 CFR 1904.10

Rules Apply to Employers Who Provide Hearing Tests

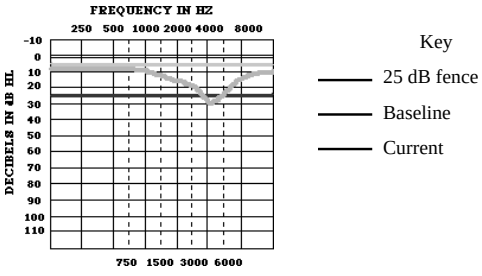
- Including:
  - Employers covered under the hearing conservation provisions of 1910.95, and
  - Employers in industries that are not covered under 1910.95, such as:
    - Construction
    - Agriculture
    - Oil and gas drilling



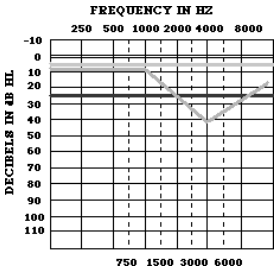
Criteria for Recordability

- Work-related hearing loss is recordable if <u>both</u> of these criteria are met
  - 10 dB Standard Threshold Shift (STS)
    - Average hearing threshold shift at 2000, 3000, & 4000 Hz is 10 db or more relative to the employee's baseline audiogram
  - 25 dB Total Hearing Level
    - Average hearing level at the same 3 frequencies is 25 db or higher relative to audiometric zero (0 dB HL)
    - Known as a 25 dB "fence"

Non-Recordable Hearing Loss



Recordable Hearing Loss

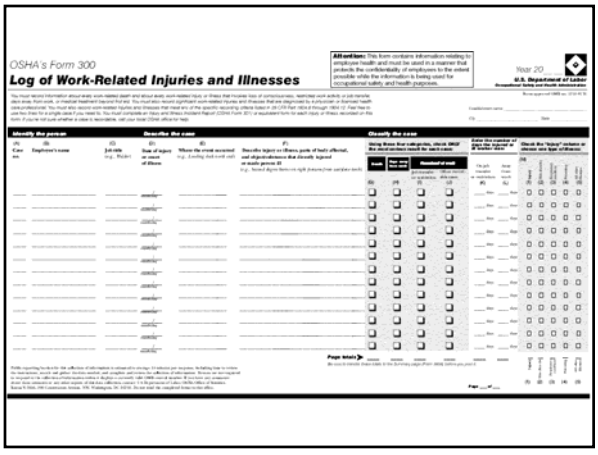


Key

- 25 dB fence
- Baseline
- Current

Age Correction of Audiograms

- Employer may use age correction to determine if STS has occurred
  - Use tables F-1 or F-2, as appropriate, in Appendix F of the OSHA noise regulation 1910.95
- Employer may not use age correction to determine if total hearing loss is 25 dB or above



OSHA's Form 300

Log of Work-Related Injuries and Illnesses

Year 20

U.S. Department of Labor

Recording Hearing Loss on OSHA 300 Log

- If no retest is planned
  - Employer must record work-related hearing loss within 7 calendar days following the test date
- If hearing loss is not persistent in following years
  - Employer may "line out" case on the 300 log for the year it was recorded

Retesting to Confirm Recordable Hearing Loss

- Employers have 30 days to complete retest
  - If retest confirms a recordable hearing loss, the employer must record the case on OSHA 300 log within 7 calendar days following the retest
  - If retest fails to confirm a recordable hearing loss, the employer does not record the case on the 300 log

Baseline Audiogram Revision

- For employees who experience a recordable hearing loss, the employer must:
  - Revise the baseline audiogram to reflect the recordable hearing loss, and
  - Compare the future audiograms with the employee's revised baseline audiogram

Determining Work-Relatedness

- Consider each case individually
  - Work-relatedness cannot be presumed solely on the basis of occupational noise exposure
  - Person who reviews the hearing test results can help the employer determine work-relatedness
    - Audiologist
    - Physician
    - Other licensed health care professional

Determining Work-Relatedness

- A hearing loss must be considered work-related, according to 1904.10(b)(5) if:
  - "an event or exposure in the work environment either caused or contributed to the hearing loss, or significantly aggravated a pre-existing hearing loss"

Summary of Rules for Recording Hearing Loss

Hearing Loss Criteria	*10 dB STS **and** 25 dB Total Hearing Level*
Recording Forms	*OSHA 300 Log*
Age Correction Allowed	*Yes, for STS criterion* *No, for 25 dB fence*
State Plan States	*Follow federal rules*

OSHA Construction Noise Standard

Noise In Construction OSHA

- 1926.52 Occupational noise exposure
  - Exposure limits identical to 1910.95
  - Same requirements for controls and PPE
  - **No specific hearing conservation requirement**
    - **"…a continuing, effective HC program…"**
- 1926.101 Hearing protection
  - Very limited requirements

MSHA Noise Standard

MSHA Noise Standard

- PEL = 90 dBA TWA_8
  - Permissible Exposure Limit
  - 8-hour Time Weighted Average
- AL = 85 dBA TWA_8
  - Action level
  - 50% of “PEL”

30 CFR 62

Hearing Conservation Program

- Mine operator must provide HCP to all employees exposed above action level
- Elements of HC Program
  - Noise assessment
  - Audiometric (hearing) tests
  - Hearing protection
  - Employee training
  - Recordkeeping

30 CFR 62

Engineering & Administrative Noise Controls

- Use all feasible engineering and administrative controls to reduce miners' noise exposure to the "permissible exposure level"(PEL)
- Hearing protectors are not permitted in lieu of such controls.

30 CFR 62

Engineering & Administrative Noise Controls

- MSHA standard places strong emphasis on the use of feasible engineering and/or administrative controls
- MSHA considers a 3-dBA reduction in noise exposure to be significant and must be implemented when feasible

30 CFR 62

Hearing Protectors

- Mine operators must:
  - Allow miner to choose from at least:
    - 2 muff type and
    - 2 plug type hearing protectors
  - Ensure that the hearing protector is
    - in good condition
    - fitted and maintained according to manufacturer's instructions

30 CFR 62

Dual Hearing Protection

- If during miner's noise exposure exceeds a TWA_8 of 105 dBA during any work shift
  - Mine operator must provide and ensure that the miner concurrently wears both
    - ear plugs and
    - ear muffs

30 CFR 62