

# **A Model Hearing Conservation Program**

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**If you have a hearing loss, this  
is what you might hear when  
someone is talking to you...**

Our o i e i on e wel loor

**...but if you had normal hearing, you would hear this.**

Our office is on the twelfth floor

# Standards and Guidelines

- MSHA Part 62 – Occupational Noise Exposure
- NIOSH Practical Guide – “Preventing Occupational Hearing Loss”
- NIOSH 1998 Criteria Document – “Occupational Noise Exposure”
- A Model Hearing Conservation Program for Coal Miners (Penn State University)

# Hearing Conservation Program

- The purpose of a Hearing Conservation Program (HCP) is to prevent the occurrence or reduce the progression of noise-induced hearing loss.
- An MSHA-compliant HCP includes:
  - Noise exposure monitoring
  - Hearing protection
  - Hearing testing
  - Training
  - Recordkeeping



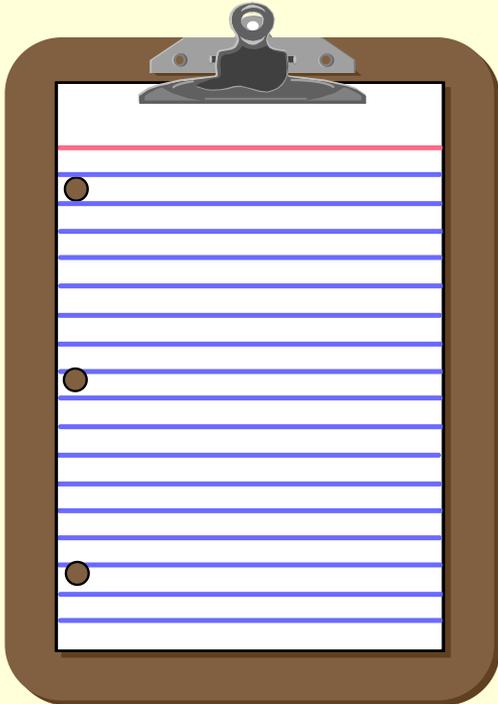
# Hearing Conservation Program

- A NIOSH-recommended Hearing Loss Prevention Program (HLPP) includes:
  - **Initial/annual audits of procedures**
  - Noise exposure monitoring
  - **Engineering/administrative noise controls**
  - Hearing testing
  - Hearing protection
  - Education **and motivation of workers**
  - Recordkeeping
  - **Program evaluation**

# HLPP Program Audit

- 1<sup>st</sup> step – before any changes are made or a new program is implemented
- **“Business Plan”**
  - Administrative issues; regulations
  - Company policies
  - Responsible individual(s)
  - Individual roles (who/when/how measures noise levels, performs hearing tests, orders hearing protectors, performs training, etc.)

# HLPP Program Audit



- Administrative issues should be examined first
- Next, go through each element of program
- Appendix B - NIOSH Practical Guide has a Program Evaluation Checklist
- Review audit annually – easily identify shortcomings or problems

# Monitoring Noise Exposures

- This part of the Hearing Conservation Program is done with either a sound level meter (SLM) or a dosimeter.
- These SLM or dosimeter noise exposure level measurements determine if a **miner's noise exposure levels are equal to or greater than 85 dB(A)**, called the Action Level.
- All miners whose noise exposure equals or exceeds the Action Level are required to be enrolled in an HCP.

# Noise Measuring Devices

- The noise dosimeter is worn by a miner as he goes about his daily work. The dosimeter takes many noise measurements and compiles them into a final reading.



- A SLM also measures the noise levels, but the noise levels are recorded and the exposures are calculated by a person.

# Engineering & Administrative Noise Controls

- 1<sup>st</sup> line of defense against loud noise
- Remove the hazard or remove the worker
- Goal: reduce the noise level so that the other elements of the HLPP are not necessary
- Technological vs. economic feasibility
- **“Buy Quiet”** policy for new equipment

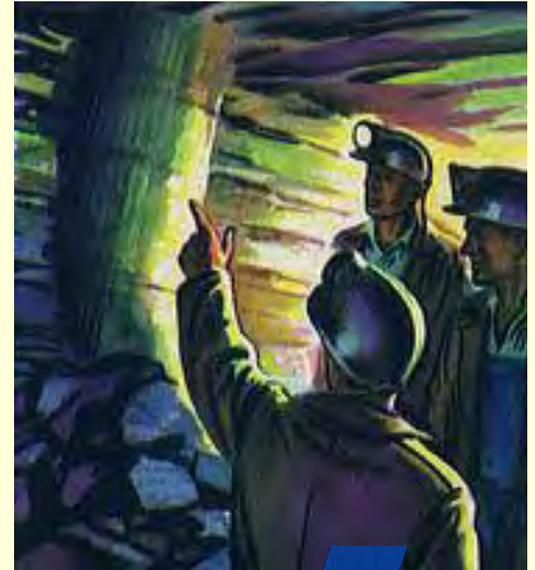
# Maintaining Noise Controls

- After noise controls have been established, they must be consciously implemented by miners and operators.
- Engineering controls must be maintained.



# Changes in equipment

- If equipment has aged, sounds differently, or is in need of maintenance, miners need to notify their supervisors.



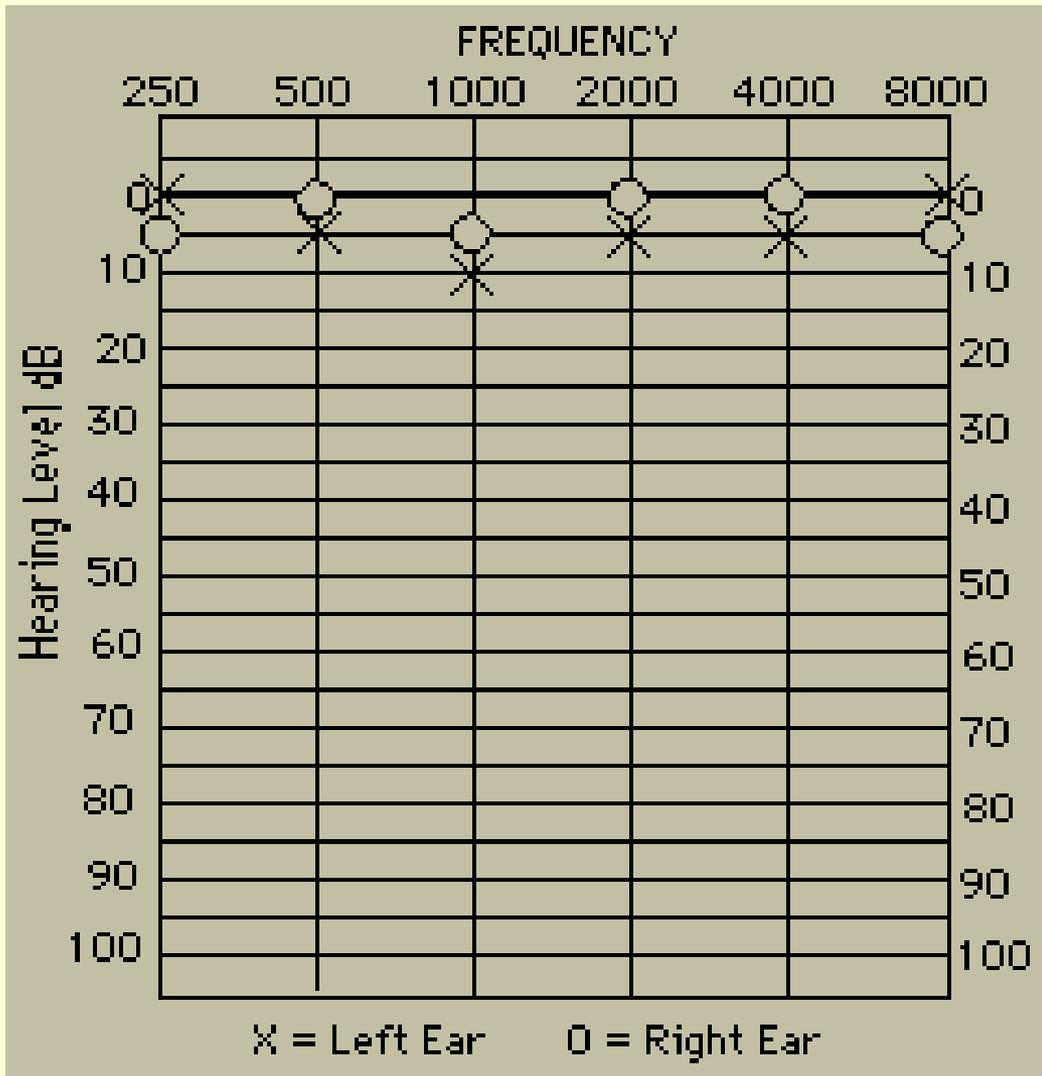
# Hearing Testing



- Hearing ability is measured for different tones in each ear
- The miner wears earphones and is placed in a test room (low background noise)
- Hearing thresholds are recorded and plotted on a graph called an audiogram



# Audiogram



- An audiogram is a graphic representation of **a miner's hearing** levels for different pitched sounds for each ear.

# Baseline Audiogram

- The **1st** hearing test is called the baseline audiogram. Future audiograms are then compared with **the baseline to determine if a miner's** hearing has gotten worse
- Done within 6 months of being enrolled in a HCP or within 12 months if a mobile testing service is used

# Baseline Audiogram



- The miner should be in a quiet area for **14 hours** or wear hearing protectors if he/she is working.

- This also means that loud noises at home should be avoided before the hearing test.





# The Hearing Test

- There is no ***passing*** or ***failing*** a hearing “test.”
- Current test is compared to the baseline hearing test -- ***changes*** in a miner’s hearing can be easily detected.
- If changes are found, immediate action must be taken (so that it doesn’t continue to get worse)

# Standard Threshold Shift

- A Standard Threshold Shift (STS) **is a decrease in a miner's hearing** by an average of 10 dB compared to the baseline audiogram.
- Miners need to:
  - start wearing hearing protectors, or
  - be re-trained about wearing protectors, or
  - wear more effective hearing protectors.

# Scheduling Hearing Tests

Audiograms should be performed on the following occasions:

1. Pre-employment (before assignment to a noise-hazardous area)
2. Annually [when TWA  $\geq$  85 dB(A)]
3. Re-assignment out of a noise-hazardous job
4. Termination of employment



# Scheduling Hearing Tests

Whether an outside vendor or in-house person conducts the hearing tests.....

1. Equipment calibration (audiometer and booth) is important
2. Audiometric technicians should be trained to CAOHC requirements
3. Testing should be done under the supervision of an audiologist or physician

# Scheduling Hearing Tests

- Baseline tests -- 14 hours noise-free
- Annual tests -- midway through or at the end of the workshift
  - Check for insufficient noise controls or inadequate use of hearing protectors
  - Immediately compare annual to baseline to identify changes and give feedback (training opportunity)



# Hearing Protection Devices

- As part of the HCP, miners must be offered a choice of hearing protection devices
- Procurement officers should not be able to over-ride the selection made by HLPP personnel





# Training

Training is done to explain:  
(MSHA standard)

- The effects of noise on hearing
- Purpose and value of wearing hearing protectors
- Advantages and disadvantages of the hearing protectors being offered
- Care, fitting, and use of hearing protectors
- **miners' and operators' tasks in maintaining noise controls**
- Purpose and value of audiometric testing

# Education & Motivation

- Those who understand the reasons for the HLPP are more likely to participate
- Managers/supervisors must attend training sessions (outline company policies and show commitment)
- Training must be tailored to the audience and their particular needs



# Education & Motivation

- Speakers/presenters must be capable of getting the miners' attention
- Peers are often very influential (e.g., if a senior miner already has a hearing loss)
- Training is best done in small groups (e.g., miners that work together and have similar noise exposures)
- Training is also very effective at the time of the annual hearing test



# Recordkeeping

- The mine operator is responsible for keeping the records of all hearing tests.
- Hearing tests, noise surveys, training records, other supporting documents, etc. are often needed many years after they are collected. If they are not stored properly (or if it cannot be determined that they were/are still valid), then they are useless.



# Program Evaluation

- Mine operator needs to evaluate how well the program is working (i.e., is hearing loss being prevented?)
  - Assess compliance with all 5 elements (***regulatory requirements***)
  - Evaluate the ***audiometric data***, both for individuals and for groups
    - ANSI Technical Report - Evaluating the Effectiveness of Hearing Conservation Programs through Audiometric Data Base Analysis (ANSI S12.13 TR-2002)

# Hearing Conservation Program

- *In addition to preserving hearing, a Hearing Conservation Program has other benefits for the employer:*
  1. Compliance with laws/regulations (avoid citations and/or fines)
  2. Promotes good labor relations (shows that management is concerned) – improves morale
  3. Reduced employee absenteeism

# Hearing Conservation Program

- *In addition to preserving hearing, a Hearing Conservation Program has other benefits for the employer:*
  4. Increased productivity  
(communication is easier with lower noise levels)
  5. Reduction in workplace injuries/accidents/lost time
  6. **Lower worker's compensation rates**  
(due to fewer claims)

# Other Noisy Activities



- Many activities (outside of work) can potentially damage hearing



- Employers should encourage employees to take earplugs home for use during noisy activities (will help reduce work-related claims).

# Hearing Conservation Program

Employee benefits:

1. Preserves hearing for social situations with family/friends
2. Preserves hearing for future work where good hearing is a prerequisite
3. Can detect hearing loss due to other causes (other than noise exposure)
4. Employees will feel better (less tired and irritable) – less stress which may lead to cardio-vascular disease
5. Avoid tinnitus



# Policy Needs

- Company policies relating to the HLPP should consider/address:
  1. Corporate environment should promote a safety culture where employees are empowered to protect their own health
  2. Program policies should be based on effective practices, rather than just compliance with government regulations
  3. HLPP must be a part of the overall company health and safety program

# Policy Needs

- Company policies relating to the HLPP should consider/address:
  4. A key individual should have ultimate responsibility for the HLPP
  5. The person in charge of the HLPP should work with management and employees to develop and implement plans/policies
  6. **Compliance with the company's HLPP** should be a condition of employment

# Policy Needs

- Company policies relating to the HLPP should consider/address:
  7. SOPs for each phase of the HLPP should be documented. Specific policy statements might include:
    - How noise surveys are scheduled
    - Procedures for audiometric testing
    - How records are maintained
    - Purchasing of hearing protectors

# Personnel Requirements

- **One person** should be ultimately responsible for the *entire HLPP*
  - This individual will ensure that all aspects of the program are fully and properly administered
  - The primary requirement should be that this person is **genuinely interested** in the job
  - His/her position/background/qualifications are not as important as the ability to focus management and worker attention on hearing conservation issues

# Personnel Requirements

- **One person** should be ultimately responsible for the entire HLPP
  - This individual's stature in the organization should allow him/her to make decisions, correct deficiencies, enforce compliance, and supervise other **team members** regarding HLPP issues



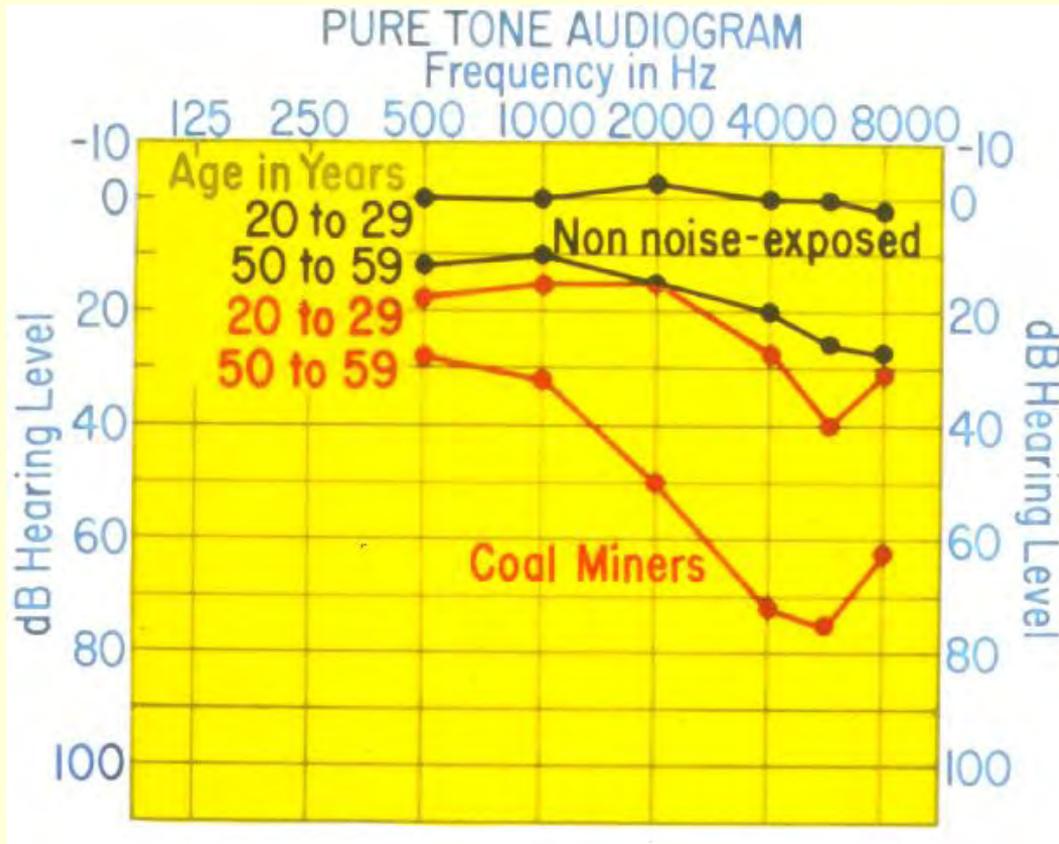
# Personnel Requirements

- In addition to the program's overall coordinator, one person should be responsible for the *audiometric aspects* of the HLPP
  - The professional qualifications of this person are important (i.e., should be an audiologist or physician specializing in otology or occupational medicine)
  - In some cases, a company will hire an audiologist or have a staff medical doctor that oversees the entire HLPP

# Personnel Requirements

- In-house staff is not always able to **provide all of the necessary services...**
  - If audiometric testing is contracted out, the vendor must understand and agree to **abide by the company's policies and SOPs** (i.e., the vendor reports to the person in charge of the HLPP just as if he/she was **under that person's supervision**)
  - Regardless of whether outside contractors are used, responsibility for the HLPP should stay with the in-house person

# Miners vs. Non-exposed



- Research has shown that miners usually have poorer hearing than other people who are not exposed to hazardous noise.
- The HCP is intended to make sure that a **miners' hearing will not get worse.**

# Summary



- Miners who have invested much of their time on the job should be able to enjoy their life outside of work; to talk with friends, hear children, listen to music, enjoy the sounds in nature.

- Conserving hearing today enables a miner to communicate with fellow miners, hear faulty machinery, or listen for “roof talk.”



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  - **"Office Presentation," PicturesNOW!, Image Gallery, 1999,** <http://picturesnow.com/html/index.asp?rand=12&uc=0&un=&search=listen&area=pn>

# For more information

- [DByrne@cdc.gov](mailto:DByrne@cdc.gov)
  - Voice (412) 386-6576 FAX (412) 386-4865
- NIOSH Criteria For A Recommended Standard - Occupational Noise Exposure - Revised Criteria 1998
  - <http://www.cdc.gov/niosh/98-126.html>
- NIOSH Preventing Occupational Hearing Loss -- A Practical Guide
  - <http://www.cdc.gov/niosh/96-110a.html>