

MSHA HEARING CONSERVATION EMPLOYEE TRAINING

This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation. Featured are:

INTRODUCTION: A brief description of the program and the subject that it addresses.

PROGRAM OUTLINE: Summarizes the program content. If the program outline is discussed before the video is presented, the entire program will be more meaningful and successful.

PREPARING FOR AND CONDUCTING THE PRESENTATION: These sections will help you set up the training environment, help you relate the program to site-specific incidents, and provide program objectives for focusing your presentation.

REVIEW QUESTIONS AND ANSWERS: Questions may be copied and given to participants to document how well they understood the information that was presented. Answers to the review questions are provided separately.

ATTENDANCE RECORD: Document the date of your presentation as well as identify the program participants. The attendance record may be copied as needed.

INTRODUCTION

Most mine workers already know the importance of selecting and using personal protective equipment on the job, but there is one hazard that may not be obvious to all of us: noise. While noise cannot be seen and its effects don't cause immediate pain, it can cause serious and dramatic damage to our hearing. We must use hearing protection in areas with high noise levels to prevent permanent injury that affects our lives and the lives of our families indefinitely.

This program stresses to miners the importance of wearing hearing protection at all times when working in areas where hazardous noise levels are present. Topics include the effects of noise on hearing, the mine operator's hearing conservation program, medical surveillance, exposure assessment and the selection and use of hearing protection.

PROGRAM OUTLINE

HOW NOISE DAMAGES HEARING

- Because hearing loss is usually not painful and happens gradually, many of us don't fully understand how our hearing can be damaged by noise exposure.
- To better understand how this damage occurs, we need to examine how loud noise can affect our hearing.
- The outside of the ear gathers sound and channels it into the ear canal. Once inside, the sound moves in waves and flows against the eardrum.
- The membrane of the eardrum vibrates against three delicate bones that carry the vibrations to the inner ear.
- The inner ear contains a coiled tube filled with fluid known as the cochlea. Inside the cochlea, fluid carries the vibrations over tiny hair structures called cilia.

- Healthy cilia are arranged in v-shaped patterns in the inner ear. As noise-induced vibrations pass over the cilia, they sway and bend.
- When they move, the cilia transmit signals to the brain which interprets them as sound.
- Noise intensity is measured in decibels. Most experts agree that exposure to noise levels around 85 decibels can damage these tiny structures.
- As the noise level grows louder, the cilia get bent farther and with more force. When exposed to this damaging level of noise, the delicate structures get damaged or destroyed and hearing loss will occur.

THE MSHA HEARING CONSERVATION PROGRAM

- To help prevent hearing loss, the Mine Safety and Health Administration requires mine operators to develop a hearing conservation program when workplace sound levels average 85 decibels over an 8-hour time-weighted period.
- This level of noise is often called the “action” level.
- The development of this program begins with a noise assessment to determine the noise levels in the work environment.
- The mine operator, along with MSHA, have established a system of noise monitoring. This monitoring is done by trained hearing professionals and is used to determine the noise levels to which each miner is exposed.
- Miners will be notified when noise exposure levels require action on the part of the mine operator and the miner to prevent hearing loss. The proper preventive action to be taken will be included in this notification.
- When the action level is reached, the miner will be enrolled in the hearing conservation program.
- The mine operator will continue noise exposure monitoring and the miner will receive training on hearing loss prevention.

ENGINEERING & ADMINISTRATIVE CONTROLS

- A noise level that exceeds 90 decibels over an eight-hour period is referred to as the Permissible Exposure Limit.
- When noise levels exceed this limit, the mine operator will put in place all feasible engineering and administrative controls to reduce the level of noise exposure.
- Affected miners will be given a written copy of the control measures and a copy will be posted on the mine bulletin board for review.
- Be sure you read, understand and follow these posted control measures. Ask your supervisor if you have any questions.

- When noise exposure levels reach 105 decibels per eight-hour period, dual hearing protection is required. This means earplugs and earmuffs must be worn at the same time to provide proper protection.

MEDICAL SURVEILLANCE & EXPOSURE ASSESSMENT

- Another key part of the hearing conservation program is medical surveillance. This includes hearing tests and evaluation by a hearing professional.
- These tests are vital in the prevention of hearing loss. The first test, known as a baseline audiogram, will help establish a baseline for each miner that serves as a starting point for future evaluations.
- The miner must avoid high levels of noise, or wear hearing protection, for the 14 hours immediately preceding this initial test.
- During subsequent hearing tests, the miner's hearing levels will be compared to the baseline to determine if any hearing loss has occurred.
- If hearing loss of at least 10 decibels as compared to the baseline audiogram is recorded, a "standard threshold shift" has occurred. This shift indicates a small level of hearing loss.
- When a standard threshold shift is detected, an examination of noise exposure and protection methods for the affected miner will occur. This includes retraining the miner to ensure that hearing protection is being selected and used properly.
- Also, there will be an evaluation of the effectiveness of engineering and administrative noise exposure controls.
- The goal of this retraining and exposure assessment is to ensure that all measures are being properly taken to prevent any further hearing loss for the affected miner.

HEARING PROTECTION

When a miner is first enrolled in the hearing conservation program and each year thereafter, training is provided on the fundamental aspects of the program.

- Perhaps the most important part of this training includes the proper selection and use of hearing protection devices.
- Each type of hearing protection device has a noise reduction rating. This is a measure in decibels of how much outside noise is reduced before it reaches the inner ear.
- The goal of any hearing protection device is to reduce the level of noise in the inner ear to a safe level. Hearing protection devices with higher noise reduction ratings offer more protection than those with lower ratings.
- A hearing professional has worked with the mine operator to evaluate the types of noise hazards in your work area and has recommended the proper types hearing protection that must be worn.
- This hearing protection will be provided by the mine operator and comes in two basic types: earplugs and earmuffs.

EARPLUGS

- Earplugs are available in different sizes and may be disposable or reusable.
- Some plugs are designed to be inserted into the ear canal, while canal caps only cover the entrance to the canal. Canal caps generally provide less protection than standard earplugs.
- Most disposable earplugs are made of polyurethane or other expandable foam that is easily compressed for insertion into the ear.
- Before inserting this type of plug, make sure your hands are clean. Then compress the foam by rolling it in your fingers.
- Pull on the top of the ear with your opposite hand and insert the plug into the opening of your ear canal. Keep your finger on the plug while it expands.
- You will know you have a good fit when placing a hand over your hear has no effect on the level of noise that you can hear.
- Some types of plugs don't require compression. This style helps prevent the transfer of dirt from the hands into the ear and reduces outward pressure on the ear canal from expansion.
- Reusable plugs can be made of silicone, rubber or plastic. They should be cleaned with soap and warm water on a regular basis and stored properly when not in use.
- Because each person's ear canal is a different shape and size, earplugs come in many shapes and sizes. Find one that fits you and is comfortable.

EARMUFFS

- Earmuffs are designed to cover the entire ear. They consist of a pair of cups connected by a headband.
- The cups are usually filled with soft foam to provide a comfortable, secure fit and a low-pressure seal.

ADVANTAGES OF PROTECTIVE DEVICES

- Each type of hearing protection device has certain advantages.
- Earplugs generally provide more protection than earmuffs and are less cumbersome. They don't interfere with other PPE. They are also inexpensive and easily replaced.
- Earmuffs are easy to use and to install properly. They eliminate the risk of ear infection from dirt getting into the ear canal and they are designed so that one size fits all.
- No matter what type of protection you choose, check with your supervisor to be sure the protection you have selected is appropriate for your work area.
- Of course, when the dual hearing protection level is reached at 105 decibels, earplugs and earmuffs must be worn together. This level of noise exceeds the capacity of earplugs or earmuffs alone.

CONCLUSION

- Keep in mind that hearing protection should not stop when you leave work. Plenty of activities off the job involve dangerous noise levels.
- No one will set up a hearing conservation for you at home; that responsibility is up to you.
- No one wants to experience a life with hearing loss. Do everything you can today to protect your hearing for tomorrow.
- Make sound decisions about protecting your hearing by participating in the hearing conservation program and always wearing your hearing protection when required. Take the necessary steps to reduce off-job noise hazards.

PREPARE FOR THE SAFETY MEETING OR TRAINING SESSION

Review each section of this Leader's Guide as well as the videotape. Here are a few suggestions for using the program:

Make everyone aware of the importance the company places on health and safety and how each person must be an active member of the safety team.

Introduce the videotape program. Play the videotape without interruption. Review the program content by presenting the information in the program outline.

Copy the review questions included in this Leader's Guide and ask each participant to complete them.

Make an attendance record and have each participant sign the form. Maintain the attendance record and each participant's test paper as written documentation of the training performed.

Here are some suggestions for preparing your videotape equipment and the room or area you use:

Check the room or area for quietness, adequate ventilation and temperature, lighting and unobstructed access.

Check the seating arrangement and the audiovisual equipment to ensure that all participants will be able to see and hear the videotape program.

Place or secure extension cords to prevent them from becoming a tripping hazard.

CONDUCTING THE PRESENTATION

Begin the meeting by welcoming the participants. Introduce yourself and give each person the opportunity to become acquainted if there are new people joining the training session.

Explain that the primary purpose of the program is to stress the importance of protecting miners from a hazard that may not be obvious to them: loud noise.

Introduce the videotape program. Play the videotape without interruption. Review the program content by presenting the information in the program outline.

Lead discussions about hazardous noise levels at your worksite and specific protection that must be worn to protect against permanent hearing loss. Use the review questions to check how well the program participants understood the information.

After watching the videotape program, the viewer will be able to explain the following:

- How noise can damage hearing;
- How the hearing conservation program works;
- How to select and earplugs and earmuffs;

**MSHA HEARING CONSERVATION EMPLOYEE TRAINING
REVIEW QUESTIONS**

Name _____ Date _____

The following questions are provided to check how well you understand the information presented during this program.

1. At what decibel level can noise began to damage cilia inside an unprotected ear?
 - a. 85
 - b. 95
 - c. 105
 - d. 115

2. The mine operator is required by MSHA to have a hearing conservation program when noise levels reach a certain limit.
 - a. true
 - b. false

3. In general, earplugs provide _____ earmuffs.
 - a. more protection than
 - b. less protection than
 - c. the same protection as

4. When noise levels reach _____ decibels, both earplugs and earmuffs must be worn.
 - a. 90
 - b. 95
 - c. 100
 - d. 105

5. What is the first hearing test that you will take that serves as a starting point for future tests?
 - a. baseline audiogram
 - b. permissible exposure limit
 - c. standard threshold shift
 - d. none of the above

6. Off-job noise poses little or no threat to a person's hearing.
 - a. true
 - b. false

7. You will know that your earplugs are fitted correctly by placing your hand over your ear and the level of noise you hear is _____.
 - a. louder
 - b. not as loud
 - c. not affected by your hand over your ear

ANSWERS TO THE REVIEW QUESTIONS

1. a

2. a

3. b

4. d

5. a

6. b

7. c