

Hazards of Noise



Health Hazard Information Card HH-15

There are many noise sources in the mining industry, such as drills, crushers, diesel engines, grinding mills, trucks, and other vehicles and machinery. Sound is “vibrational energy” which compounds the problem of trying to control noise and its harmful vibrations.

What is noise?

- unwanted sound
- annoying sound
- harmful sound

What are the effects of too much noise?

Noise exposure which is too intense, too shrill, a sudden blast, and/or prolonged may cause:

- temporary hearing loss
- interference with speech and audible warning signals
- physical effects such as fatigue and circulatory problems
- physiological effects such as irritability, tension, anxiety
- rupture of the ear drum
- damage to the bones of the middle ear
- noise-induced hearing loss

Is hearing loss a serious problem?

There is no known medical treatment to correct noise-induced hearing loss. One of the first symptoms is loss of hearing at the higher frequencies which includes high-pitched sound (4000 Hz). Such loss may go unnoticed at first; but with prolonged exposure

and no controls, the loss increases and may involve the speech frequencies (500 to 3000 Hz). Being unable to hear is a safety hazard as well.

What are the allowable limits?

MSHA standard 30 CFR Part 62 allows a maximum noise level of 90 dBA (100% of allowable exposure) for 8 hours. The allowable level varies with the time of exposure; that is, for every increase of 5 dBA, the exposure time is cut in half. The MSHA noise standard lists exposure levels with the time allowed, a few of which are:

- 95 dBA (200%) = 4 hours exposure per day
- 100 dBA (400%) = 2 hours exposure per day
- 115 dBA (800%) = 15 minutes or less per day

How are noise levels measured?

Most noise exposures at mining operations vary in level and frequency during a working shift. MSHA measures personal noise exposure with a noise dosimeter with an attached microphone worn near the worker's ear for a full shift. This instrument is actually two dosimeters - one which records all noise from 90 dBA to 140 dBA, and one which records all noise from 80 dBA to 130 dBA. This instrument gives results of noise exposure in both dBA and in percent dose.

A noise exposure of 100% corresponds to that of 90 dBA for 8 hours. Readings greater than 100% indicate exposure above the allowable limit. An exposure of 200% is twice the allowable limit (2 X 100%) and

corresponds to a continuous noise exposure of 95 dBA for 8 hours. A citation for excessive noise exposure is not issued until the exposure, as measured with a dosimeter, reaches 132%. The reason for this is that the noise dosimeter has a ± 2 dBA ($\pm 32\%$) range of uncertainty.

In addition to using a noise dosimeter, an MSHA inspector may measure decibel levels with a sound level meter. These instruments are useful in locating particular areas, determining which machines are primary noise sources, and as confirmation for personal noise dosimeter measurements.

What controls are necessary?

MSHA standards require that, when noise exposure exceeds the allowable limit as measured with a dosimeter, mine operators use the following means to protect workers:

Engineering controls

These controls reduce noise at its source or in the path between the source and the worker. They include:

- exhaust mufflers
- enclosures and booths
- shields and barriers
- environmental cabs for mobile equipment

Administrative controls

These controls reduce exposure time for workers. They refer to:

- dividing a task or job among employees for limited time periods (for example, scheduling two bulldozer operators at a half-day each)
- arranging work to be performed at ‘down times’ (after regular work hours, on weekends, etc.)

Personal hearing protection

The workers' last means of defense against hearing loss due to harmful noise levels are personal protective devices such as ear plugs or ear muffs. These devices do not always provide the protection expected, and they offer NO protection to any other parts of the body from vibrational energy. MSHA allows limited use of hearing protectors whenever:

- feasible controls do not exist
- controls fail to reduce noise levels and exposure to permissible limits
- controls are being installed or fabricated

To be effective, personal hearing protectors must be appropriate, and properly fitted, cleaned, maintained, and worn.

For information on Hearing Conservation Programs, see Health Hazard Card HH-31. For additional information and assistance, contact the Health Divisions, Arlington, Virginia:

Metal/Nonmetal
(202) 693-9630

Coal
(202) 693-9510

or contact

**Pittsburgh Safety and Health
Technology Center**
(412) 386-6901

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