EHS Guidance Sheet
Hearing Conservation

Noise is one of the most pervasive problems in today's occupational environment. Exposure to hazardous levels of noise can result in temporary or permanent hearing loss. Because of this hazard, the Occupational Safety and Health Administration (OSHA) developed the noise standards designed to protect workers who are occupationally exposed to excessive noise.

In compliance with OSHA standards, the University of Idaho has developed a Hearing Conservation Program (HCP) that provides policies and guidance to protect workers from occupational noise. All employees shall adhere to the HCP as applicable.

Effects of Noise

Exposure to moderate to loud noise levels will inevitably cause hearing loss over time because of damage to nerves in the inner ear. The body can generally repair some damage, particularly when caused by short exposures to moderate sound pressures. However, permanent damage is more likely to occur with long-term exposure to hazardous noise levels or short-term exposure to very high noise levels.

The risk of hearing impairment is primarily related to:

- the intensity of the noise (sound pressure, measured in decibels or dB)
- type of noise (frequency spectrum)
- period of exposure each day
- total work duration

Short-duration exposure carries less risk of hearing impairment than long duration exposure to the same sound pressures. Therefore, OSHA occupational exposure and action limits are expressed as 8-hour Time Weighted Averages (TWA). OSHA requires employers to establish an effective HCP when an employee's exposure to noise exceeds an 8-hour TWA of 85 dBA (sound pressure measurements are usually expressed as dBA). The Permissible Exposure Level (PEL) is 90 dBA.

To put this into perspective, normal conversation is generally about 60 dBA; a belt sander produces about 93 dBA of sound; and an ambulance siren is about 120 dBA. OSHA's TWA accounts for the fact that an employee may not be exposed to a constant level of sound for the entire work day. In general, the higher the sound level, the less time that an exposure can occur without increased risk of hearing damage. In general, for every 5 dBA increase in sound pressure, the exposure time is reduced in half (this is referred to as the exchange rate). For example, OSHA's action level of 85 dBA is based on an 8-hour work day. If the sound pressure is raised to 90 dBA, an equivalent exposure time is 4-hours. At 110 dBA, an equivalent exposure time is 30 minutes.

Noise Level	Exposure Limit
90 dBA	8.0 hours
92 dBA	6.0 hours
95 dBA	4.0 hours
97 dBA	3.0 hours
100 dbA	2.0 hours
102 dBA	1.5 hours
105 dBA	1.0 hours
110 dBA	30 minutes
115 dBA	15 minutes

Protecting Against Hearing Loss

As required by OSHA regulations, UI has established a HCP, which is designed to protect employees from the hazards of exposure to noise in excess of the occupational action and exposure limits. Major elements of the UI HCP include the following:

- Evaluation and measurement (monitoring) of exposures
- Audiometric testing
- Training
- Controls

Noise Monitoring

In general, noise monitoring should be conducted when it is suspected that an employee's exposure to noise exceeds occupational action or exposure limits. This is generally triggered by one of the following:

- Employee complaints related to sound levels.
- Difficulty in hearing conversations while at or near a noise source, or ringing in the ears after removal from the source.
- Presence of equipment or operations commonly associated with increased sound levels.

EHS conducts noise monitoring to measure actual sound levels and exposures upon request. If monitoring indicates that an action level is exceeded, affected employees are enrolled in the UI HCP.

Audiometric Testing

Employees subject to the UI HCP must receive a baseline audiogram within six (6) months of assignment to tasks that mandate their participation in the HCP. This timeframe can be extended to one (1) year if a mobile test van is used for audiograms. Employees enrolled in the program must receive an audiogram annually thereafter. Audiograms are provided at no cost to employees who are required to participate in UI's HCP.

An audiogram can detect early stages of hearing loss, while steps can still be taken to prevent further deterioration. It can also be useful in detecting medical conditions of the ear unrelated to noise exposure. During the audiogram, the attending physician/technician will test the ability of an individual to detect sounds in each ear at various frequencies, while providing protection from background noises. The results are then compared to previous test results to determine if a hearing loss is indicated. For OSHA purposes, a significant change is referred to as a Standard Threshold Shift (STS), and is defined as a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000 and 4000 Hz in either ear. The results

of the audiometric testing are communicated to each worker and their supervisor by the attending technician or physician and/or EHS. Results of the audiogram are provided to EHS for review.

If an abnormality is detected through the audiogram process, an employee will be scheduled for a second confirmatory test. They may also be referred to a physician if the impairment may be related to something other than noise exposure. The cost for visiting a personal physician for non-work related hearing loss is not the responsibility of the University or employing department.

EHS will re-assess an employee's exposure, and if necessary repeat noise level monitoring, in response to a confirmed occupational hearing loss to determine if the assigned hearing protectors are adequate. EHS will also provide for re-fitting of hearing protectors and re-training.

Training

Employees included in the HCP receive initial and annual training through Netlearning@uidaho. Instruction is provided on the following: effects of exposure to noise; purpose, advantages and disadvantages of various types of hearing protection devices; selection, fit and care of hearing protection devices; purpose and procedures of audiometric testing.

Hearing Protectors

If engineering controls are not feasible, hearing protection must be provided to and worn by workers exposed to noise levels in excess of the OSHA action limit (85 dBA- 8 hour TWA). The cost of hearing protectors is the responsibility of the employer. Based on exposure data, EHS will provide recommendations for hearing protectors that will provide sufficient attenuation, upon request. EHS will also instruct employees on proper use and care of assigned hearing protectors.