Chapter 15 - Noise

Introduction

This chapter contains information on the effects, evaluation, and control of noise. For assistance in evaluating a noise problem, contact the Responsible Safety Officer.

Danger of Noise

Exposing the ear to high levels of noise may cause hearing loss. This loss can be temporary or permanent. Temporary hearing loss or auditory fatigue occurs after a few minutes exposure to an intense noise but is recoverable following a period of time away from the noise. If the noise exposure is repeated, there may be only a partial hearing recovery and the loss becomes permanent. Typically, significant hearing losses occur first in the frequency range of 3,000 to 6,000 hertz (Hz). Losses in this frequency range are not critical to speech perception, and the individual usually is completely unaware of this initial symptom. With longer exposures, the hearing loss spreads to lower frequencies, which will affect speech perception. The evaluation of hearing loss due to noise is complicated by the fact that hearing acuity normally decreases with increasing age. Further, the losses associated with age are quite similar to those caused by excessive noise since the hearing for high frequency sounds is most affected in both instances. Hearing impairment may also result from infections, tumors, and degenerative diseases.

Hearing Conservation Program

Purpose

This is a developed hearing conservation program to provide guidelines to protect employees from potential hearing loss.

Scope

This program will establish the minimum hearing protection requirements for employees.

Responsibilities

The Company will be responsible for the enforcement and disciplinary action resulting from violation or failure of assigned persons to implement the requirements of this program.
The Responsible Safety Officer or designee will be responsible to provide for the monitoring of work activities to assure compliance to the requirements of this program.

The primary responsibility for the implementation of the requirements of this program will rest with the Supervisor.

Requirements

The standard permits an unprotected, 8-hour permissible exposure limit (PEL) of 90 decibel-A scale (dBA) for continuous noise. Higher unprotected exposure is allowed provided there are sufficient periods of noise exposure low enough to maintain a PEL below 90 dBA. The maximum allowable exposure level is 110 dBA for thirty minutes. Unprotected exposures above 110 dBA are not permitted regardless of duration.

OSHA Continuous Noise Exposure Limits Equaling 100% Dose – Table G-16

<table>
<thead>
<tr>
<th>OSHA PEL, dBA</th>
<th>Maximum Duration Minutes (hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>690 (16)</td>
</tr>
<tr>
<td>87</td>
<td>720 (12)</td>
</tr>
<tr>
<td>90</td>
<td>480 (8)</td>
</tr>
<tr>
<td>92</td>
<td>360 (6)</td>
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<tr>
<td>95</td>
<td>240 (4)</td>
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<tr>
<td>97</td>
<td>180 (3)</td>
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<tr>
<td>100</td>
<td>120 (2)</td>
</tr>
<tr>
<td>102</td>
<td>90 (1½)</td>
</tr>
<tr>
<td>105</td>
<td>60 (1)</td>
</tr>
<tr>
<td>110</td>
<td>30 (1/2)</td>
</tr>
<tr>
<td>115</td>
<td>15 (1/4)</td>
</tr>
</tbody>
</table>

The PEL is based on 100% dose of the allowed exposure. Table G-16 shows the noise level and corresponding time limits that result in a dose of 100%. 92 decibels for 8 hours is the same dose as 110 dBA for two hours.

The standard defines impact or impulse noise as noise with the duration of one second or less. The PEL for impact noise is 140 dBA, peak sound level.

The OSHA standard requires that employees be included in a hearing conservation program if their full shift exposure exceeds the action level by 50%. Employees working 12 hour shifts exceed the action level with a 12 hour average noise exposure of 82 dBA. Employees working 12 hour shifts exceed the permissible exposure limit of 100% dose at 87 dBA.

Hearing Protection
Hearing protection devices are available to employees who are exposed to noise above the action level. Employees who have shown a standard threshold shift measured on their annual audiogram must wear hearing protection at all times in the workplace. Hearing protection must be worn when an employee is working in an area above 90 dBA.

There are two types of hearing protection devices available. These are the circumoral device, better known as an ear-muff, and the insert device. Each type provides a different degree of protection and the employee must be properly trained in its use to obtain the maximum protection.

A. Circumoral or "Ear Muffs"

Circumoral hearing protection seals the area around the entry to the ear canal by means of a liquid or foam filled cushion and has a band connecting each muff. Some models may also be attached to hard hats. This type of protection is easily donned and requires minimal training. It does not require fitting. They provide noise attenuation in a range of 15-25 dBA. The effectiveness of these devices is dependent on the seal around the ear. Temple bars on safety glasses can reduce the protection factor of ear muffs. One advantage of ear muffs is that they may be used in conjunction with insert type hearing protectors to maximize protection.

B. Insert or "Ear Plugs"

Insert devices or "plugs" are available in pre-formed or user-formed styles and may be disposable or non-disposable. Insert plugs provide noise reductions in the 20-30 decibel range. These devices are inserted into the ear canal by the user and their effectiveness depends on proper insertion. Providing training to the user and practice by the user are imperative to insuring a good fit to insure maximum protection.

**Audiometric Testing**

Audiometric testing is a means of determining if an employee's hearing is being adversely affected by noise exposure in the workplace.

A. Baseline Audiogram (when applicable) - will be established against which subsequent audiogram can be compared.

Audiometric testing is to establish a baseline, which must be preceded by at least 14 hours without exposure to high noise levels. Hearing protection may be used prior to the audiometric test to insure the employee is not exposed to high noise levels.
An annual audiogram may be substituted for the baseline audiogram when in the judgment of the audiologist or physician making the evaluation:

1. The standard threshold shift revealed by the audiogram is persistent; or

2. The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

B. Annual Audiometric Testing (when applicable) - results should be compared to the baseline to identify any changes in an individual's hearing threshold. If the audiogram shows a 10 decibel reduction of hearing capability at 2000, 3000, or 4000 Hertz, a repeat audiometric test should be done within 30 days. This 10 dBA reduction at these frequencies is referred to as a “Standard Threshold Shift” (STS).

A repeat audiogram that shows a permanent threshold shift requires that a full assessment of the hearing loss be completed. Unless a physician has determined that the STS is not work related or aggravated by occupation noise exposure, the employer should insure that:

1. The employee is notified in writing within 21 days of the determination that the STS is permanent.

2. Employees should be trained in the use of hearing protection and required to use the protection devices.

3. The employee should be referred for a clinical audiological or otological examination if additional testing is needed or if Contractors suspects a medical condition is caused or aggravated by wearing hearing protection.

Employee Training and Information

Hearing conservation training should be given to all employees. Training should consist of information on the physical nature of sounds, the effects of noise on the ear and the proper use of hearing protection. Employees that work in high noise areas (>85 dBA) should also be trained for a basic understanding of noise monitoring, work areas with high noise levels, and the purpose of audiometric testing.

Each employee that should be required to work in an area above the action level must complete and obtain an acceptable score on the Hearing Conservation Exam.

A. Record keeping
This exam must be maintained in the employee training files at the Corporate Office.

Noise exposure monitoring records should be retained for at least two years. Audiometric test results should be retained for the duration of the employee(s) employment plus 30 years.

B. Access to Records

Employees may have access to the noise exposure monitoring records and audiometric test results under the OSHA standard "Access to Employee Exposure and Medical Records", 29 CFR 1910.20. For access to these records, a written request for the records must be made to the Human Resource Department.