

Midland Engineering Co., Inc. Safety Management System			Doc No:	NOISE
			Initial Issue Date	12/14/15
Chapter 27-Noise Exposure & Hearing Conservation			Revision Date:	Initial Version
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POLICY

Midland Engineering Co., Inc. is committed to provide a hazard free workplace and will take all practical measures by implementing engineering, administrative, or personal protective equipment controls to eliminate the hazard of excessive noise levels through a Hearing Conservation Program that will ensure the safety, health, and hearing conservation of all employees.

SCOPE

Compliance with this program is mandatory and is applicable to all employees of Midland Engineering Co., Inc. Failure to comply will result in disciplinary action and/or is grounds for termination.

SUMMARY

To ensure that Midland Engineering Co., Inc. is in compliance with 29 CFR 1910.95, all employees exposed to high noise levels in the workplace where exposure is equal to or exceeds a time weighted average (TWA) of 85 decibels for an eight hour period will receive annual audiometric testing to establish a baseline for future reference. In addition, employee training will provide all applicable employees with information necessary to understand noise, the hazards associated with noise, the proper use and care of protective equipment, and when and where hearing protection is required.

RESPONSIBILITY

The Safety Director will administer this program and maintain all records at the corporate office.

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DEFINITIONS

Frequency- is the pitch of the sound (high or low)

Intensity- refers to the loudness of a sound

Decibels (dB) - units used to measure the loudness of sound

Baseline - the first audiometric exam results used for future reference

Noise Reduction Rating (NRR)- sound level protection built into a hearing protection device

INTRODUCTION

Hearing loss due to excessive noise exposure in the workplace is usually not identified as a health hazard because it often takes a long period of time to develop. By the time hearing loss is detected, it is too late to correct it. Loss of hearing is frequently blamed on the aging process and little thought is given to the possibility that damage occurred in the workplace. Studies have linked exposure to high noise levels with headaches, high blood pressure, ulcers, and sleeping disorders.

WHAT IS NOISE?

Noise is something that everyone is exposed to on a daily basis either at home, work, or recreation. It can be described as unwanted sound that can be loud, prolonged, and deafening. The effects of sound depend on the loudness in relationship to pitch, length of exposure, and a person's existing health and age. Temporary hearing loss is attributed to short-term exposure and normal hearing usually returns within a short amount of time. Prolonged exposure to high noise levels over a period of time gradually causes permanent hearing damage.

To understand how sound affects our hearing it is important to identify and examine the source. Sounds are sent into the air as vibrations that are known as *sound waves*. These sound waves enter the ear and are changed into nerve impulses that are received by the brain and are then interpreted.

The ear identifies sound through *frequency* and *intensity*. Frequency is the pitch of the sound and can be high or low. A high frequency sound tends to cause more damage to the ear than a low frequency sound. Intensity refers to the loudness of the sound. Decibels (dB) are used to measure the loudness of sound. Intensity is used to establish hearing protection guidelines in the workplace. If the intensity of noise exceeds an average of 90 dB over an eight-hour workday hearing loss may result.

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TYPES OF NOISE

There are three types of noise to understand:

- *Wide Band*- Noise that is spread over a wide range of pitches. An example is a production area, where many machines operate at the same time producing different pitches.
- *Narrow Band*- These noises are associated with a narrow range of pitches. An example is a power tool.
- *Impulse/Impact*- Impulse noise can be identified by temporary “beats” that can occur in a pattern or randomly. An example is a hammer.

THE EFFECTS OF NOISE

Overexposure to noise can cause temporary hearing loss and permanent hearing loss can occur due to exposure over a period of years. High blood pressure, headaches, ulcers, and irritability may exist from high noise exposure. The strain of talking or listening over loud sounds may cause communication problems and misunderstood instructions resulting in production errors. Reasons for hearing loss may include not wearing ear protection, not wearing ear protection properly, use of inadequate ear protection, and exposure to off-the-job noise where ear protection is not used, and ear infection or disease.

THE PURPOSE OF AUDIOMETRIC TESTING

The purpose of audiometric testing is to measure an employee’s level of hearing. This test is an effective tool for early detection of hearing loss. The results from the exam are recorded on an *audiogram*. The first exam is called a *baseline* and it shows the endurance level for each ear and provides a reference for future test results. This exam is conducted annually and any change in hearing ability is recorded. This change is known as a *hearing threshold shift*. The employee shall be notified in writing within 21 days of the conclusion that there is a hearing threshold shift. Audiometric testing will be performed by a certified physician. If a threshold shift has occurred, use of hearing protection shall be re-evaluated and/or refitted and if necessary a medical evaluation may be required.

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MONITORING & REQUIREMENTS

Midland Engineering Co., Inc. will conduct noise level surveys when applicable and advise employees of the various noise levels present. Monitoring will be completed in a manner that will accurately identify employees who are exposed to noise. Noise level monitoring will take place when new equipment, machinery, or production processes are introduced into the workplace. Every effort will be made to make engineering or mechanical changes where feasible, to eliminate or reduce noise to a level below 85 dB. However, employees are required to wear hearing protection where noise levels equal or exceed 85 dB. Exposure measurements shall include the following:

- Audiometric testing will be performed by a licensed or certified audiologist or physician
- All intermittent, continuous, and impulsive noises within 80-130 dB.
- Employees will receive baseline audiograms within 6 months of exposure. Baseline audiograms shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protection may be used to meet the requirement and employees shall also be notified to avoid high levels of noise.
- Measurements shall be taken during normal working hours and procedures.
- Employees who are monitored must be informed of the results.
- Monitoring instruments shall be calibrated.
- The final report shall include: Employee monitored, type of instrument used, calibration date, monitoring area, TWA, peak sound exposure, and date employee was monitored.

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DESIGNATED HEARING PROTECTION AREAS

While a time weighted average of 85 dB may not be present at some work areas, there are designated areas in the operation where the noise level *may be* equal to or exceed 85 dB. As a result, all employees are required to wear hearing protection whenever they are working in these designated areas. Midland Engineering Co., Inc. will provide proper hearing protection at no cost to all employees and visitors who have a chance of exposure at 85 dB or greater. Midland Engineering Co., Inc. shall provide training to ensure proper wear, care and use of hearing protectin.

Due to the style of fieldwork the company performs, seldom at the same location, it is difficult to determine when specific exposures may occur. All employees, assisting employees, and visitors in hearing protection required areas will be supplied with and wear hearing protection.

THE PURPOSE OF HEARING PROTECTION

Hearing protection can help prevent the loss of hearing and it is important to understand what hearing protection devices are best for the workplace. There are advantages and disadvantages to all types of hearing protection. The hearing protection depends on sound level protection built into the hearing protection device. These levels are known as the *Noise Reduction Ratings* (NRR). The number on the label indicates the hearing protection effectiveness.

HEARING PROTECTION DEVICES

Midland Engineering Co., Inc. shall evaluate hearing protection for the specific noise environments in which the protector will be used.

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Earplug Protectors

These hearing protection devices are normally referred to as inserts or earplugs. These types of earplugs are made of rubber, plastic, acoustical fibers, foam, and wax impregnated cotton.

- *Molded Inserts.* They usually have an NRR within the range of 25-26 dB and are made of soft silicone, rubber, and plastic. *Advantages:* Generally inexpensive, able to wash and reuse, and there is little danger of inserting the plug too far into the ear canal. *Disadvantages:* Often hard to get a snug fit because of ear canal sizes, eventually the molded insert hardens and shrinks, must maintain a variety of sizes, and possible allergic reaction due to earplug material.
- *Form-able Inserts.* Due to the design of form-able inserts, they have an NRR that ranges from 27-33 dB. The materials used are often fine glass fiber, expandable plastic, foam, and wax impregnated cotton. *Advantages:* Can fit all ears, mold to the ear canal, and available with a cord. *Disadvantages:* Possible to push plug too far into the ear canal, usually good for one time use, becomes dirty easily, and more prone to cause ear infections.

Canal Cap Protectors

This type of protection is made to rest against the outer edge of the ear canal. They are made of a soft rubber and are held in place with a headband. The NRR on this type of protector ranges from 17-25 dB.

- *Advantages:* Reusable and one size fit all with an adjustable headband.
- *Disadvantages:* Does not provide a high NRR, and requires regular cleaning.

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Earmuff Protectors

Earmuffs are designed to fit over the entire ear and ear lobe and seals against the side of the head with suitable cushion or padding. They generally have an NRR that ranges from 22-29 dB when used properly.

- *Advantages:* A good alternative to those who are allergic to inserts, easy to replace the protective seal, and many can be adjusted easily to fit an individual's head.
- *Disadvantage:* Perspiration eventually stiffens the plastic seal, not practical for confined space work, electricians need to wear non-conductive earmuffs, and efficiency of the muff type protector is reduced when worn over the frames of eye protection.

FIT & CARE FOR HEARING PROTECTION

Earplugs

- *Proper Fit:* Wash your hands. Slowly roll and compress foam plugs into a very thin cylinder. Reach around the head and pull the ear outward and upward during insertion. While compressed - insert plug well into the ear canal, and hold in place for a moment until it begins to expand.
- *Proper Care:* Keep plugs as clean as possible. Inspect before reinsertion and if damaged or dirty - dispose of immediately and replace. Periodically check to be sure the fit is still snug, and do not share ear plugs with others.

Earmuffs

- *Proper Fit:* Earmuffs must fully enclose the ears to seal against the head. Adjust the headbands so cushion exerts even pressure, and keep hair from underneath the cushion.
- *Proper Care:* Clean with warm water and mild soap; do not use alcohols or solvents to clean cushions. Replace the cushion if stiff, worn, cut, or torn, and check the headband for deterioration.

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RECORD KEEPING & EMPLOYEE ACCESS

Employees have the right of access to any and all information regarding this hearing conservation program as well as the right of access to the results of their individual audiogram and related audiometric test results. Employees are responsible for understanding the results and corrective measures to be taken. Hard copy audiometric test results will be kept in the employee personnel file.

- Audiometric test results will be retained for the duration of the tested employee's employment and as long thereafter as inactive records are maintained.
- Job site and equipment noise exposure measurement records will be retained for two years, or until new measurements are recorded.
- All records pertaining to hearing conservation shall be provided upon request to employees, former employees, representatives designated by the employee and the Assistant Secretary of Labor.

INFORMATION & TRAINING

Midland Engineering Co., Inc. will conduct annual information and training sessions. Information and training requirements will be accomplished through handouts and video programs. Topics will include a review of this program, how noise effects hearing, how hearing works and is diminished by excessive noise, where hearing protection is required, and the selection, fitting, use, and care of hearing protection devices. Upon completion of training all employees will be given a written quiz to test their understanding of the material covered. All information and training will be documented and kept in employee personnel files.

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PERMISSIBLE EXPOSURE LIMITS CHART OSHA CFR 1910.95

<u>DURATION PER DAY (Hours)</u>	<u>SOUND LEVEL (dBa)</u>
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
1/4 or less	115

Noise levels are determined using a Type 2 sound level meter measuring on the A-scale at slow response. Maximum level 140 dB impoort noise.

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Hearing Conservation Quiz & Acknowledgment of Training

Name: _____ Date: _____

1. Exposure to unwanted sound can be controlled. True False
2. Signs posted in a work area requiring hearing protection are only for people who wear hearing aids. True False
3. You should wear earmuffs loosely to allow proper ventilation. True False
4. Exposure to sound levels above 85 decibels over a long period of time will result in hearing loss. True False
5. The noise from your lawn mower at home can affect your hearing as much as noise at work. True False
6. Only one audiometric test is required to determine if there has been a loss of hearing. True False
7. Loudness, length of exposure, and distance from the source determines if hearing damage can result. True False
8. If you hear a ringing in your ears chances are you have been exposed to dangerously high sound levels. True False
9. Using cotton as a form of hearing protection is acceptable. True False
10. Improper care of your hearing protection can lead to ear infections. True False
11. If you have hearing damage the ear will heal after a few months. True False
12. You do not have access to your audiometric test results. True False

I acknowledge that I have received information and training on the Hearing Protection Program. This training has given me important information regarding the following topics:

- **A review of the Hearing Conservation Program.**
- **How noise affects hearing.**
- **How hearing works and is diminished by excessive noise.**
- **Where hearing protection is required.**
- **The selection, fitting, use, and care of hearing protection devices.**

I agree to abide by all rules, policies, and procedures set forth in the Hearing Conservation Program. If I do not understand any instructions I will ask questions.

Employee Signature

Date

Instructor Signature

Date