**HEARING CONSERVATION**

**INTRODUCTION**

This information provides supervisors a basic knowledge of noise, hearing, and the effects of noise on hearing. 29 CFR 1910.95 and 29 CFR 1926.52 govern all aspects of the Hearing Conservation Program for the respective industries. Paragraphs (c) and (d)(1) state each employer will "Implement and maintain a continuing program of education and indoctrination on noise exposure control." If any additional information about noise, its effects, or protection from its hazards is required, call your local OSHA or OSHCON office.

**HEARING CONSERVATION PROGRAM**

The purpose of this program is to protect employees from hearing loss by training all personnel who are routinely exposed to potentially hazardous noise. Training should include:

* identification of potentially hazardous or undesirable noise exposure areas and specification of noise exposure limits;
* establishing which employees need personal hearing protection;
* establishing a pre‑exposure baseline by conducting pure tone threshold audiograms and perform regular follow‑up evaluations; and
* maintaining hearing conservation data and information on exposed employees exposed.

Determine If a Program Is Required

29 CFR 1910.95 and 29 CFR 1926.52 Occupational Exposure to Noise state that protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in the table below. When employees are subjected to sound levels exceeding those below, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound to levels required by the table below, personal protective equipment shall be provided and used to reduce sound levels. A monitoring program will be implemented whenever employee noise exposure equals or exceeds an 8‑hour time‑weighted average (TWA) sound level of 85 decibels, measured on the A‑scale (slow response) or, equivalently, a dose of fifty percent. These values are considered to be the action level. At least annually after obtaining a baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above an average 8‑hour time‑weighted average of 85 decibels.

How To Eliminate Hazardous Noise

* Engineering Controls: use barriers, enclosures, and/or equipment replacement.
* Worksite Controls: use documentation and recordkeeping, sound surveys, education on hearing loss and hearing conservation.
* Personal Protective Equipment: use inserts, muffs, and/or helmets.
* Administrative Controls: establish adequate equipment maintenance programs, control employee work schedules, and define permissible noise levels for new equipment.

**THE ROLE OF MANAGERS AND SUPERVISORS**

Develop a Written Program

A written program should include:

* Noise Education: List noise exposure(s), findings, how noise affects the employee, and company policies & procedures.
* Training: Demonstrate proper maintenance, fit testing, and proper use of hearing protection devices.

Managers and supervisors need to stress the importance of hearing conservation with their employees. Each individual must be responsible for since protective devices are useless if not used. The most effective motivational method is by example. For instance, when three employees and their supervisor are working next to an aircraft during an engine run procedure, the employees will be more likely to wear hearing protection if the supervisor does.

Managers and supervisors should:

* Recognize their personal responsibility for insuring that employees wear hearing protection devices when potentially hazardous noise is encountered.
* Reflect the employees willingness to use personal hearing protection in their evaluation/appraisal reports.
* Insure that everyone is following noise‑safety regulations and directives.
* Determine when new hearing protection devices are required, issue the appropriate equipment, and refer employees for other medical assistance when indicated.
* Provide routine equipment inspection.
* Maintain records to indicate the type of hearing protection issued to an individual and insure that the devices issued are compatible with work or tasks the individual must perform. If noise muffs are indicated and are considered appropriate, the supervisor should institute appropriate action to insure that the muffs are ordered and issued.
* Maintain records to insure all noise‑exposed employees receive baseline audiograms. Tests that establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. New audiograms should be taken annually for each employee exposed at or above an 8‑hour time‑weighted average of 85 dBA.
* Keep unprotected personnel out of areas that are designated as hazardous noise areas.

**DISTINGUISHING BETWEEN "NOISE" AND "SOUND"**

Noise is defined as any undesirable sound, even though it might be a meaningful one. The criterion of undesirability is based on the sound capacity to disrupt communications or interfere with other day‑to‑day activities considered to be normal. Some important characteristics that make up "noise" are:

* Intensity level are also considered. Usually, higher frequency noise is more irritating, at equal intensity, than are lower frequency noises.
* The time and place of the occurrence of the noise is another factor. Noise in open space is less annoying than in enclosed place. Daytime noise tends to exert less impact than night time noise.
* Individual background plays a special role in the "noise effect." Sensitive individuals may be effected more; first timers will notice noise more than persons acclimatized or being in the area for a longer period of time.
* Duration of the noise will play a direct role on the impact the noise will make in any particular individual.

Unprotected exposure to hazardous noise can result in a hearing loss. Unfortunately, acquisition of a noise‑induced hearing loss is not readily apparent to an individual. A noise‑induced hearing loss is sensorineural, which is irreparable due to nerve damage. In its early stages, hearing loss occurs in a frequency area not readily apparent to the individual. Hearing loss due to noise may be accompanied by noticeable high pitch ringing, or aural tinnitus. If noise‑induced hearing loss continues, it will progressively involve higher and lower frequencies. Finally, the loss progresses to a degree that impairs speech communication (audiometrically from 500 to 2000 Hz). When this occurs, the individual experiences increased difficulty in understanding voice communications.

Prevention requires noise control measures be initiated at the beginning of an individual's noise exposure work life and continued throughout that work life. A noise‑induced prevention plan depends on the individual's awareness of the noise exposure and the potential hazards. Individuals must possess the self‑discipline to wear the hearing protection devices

Simply controlling potentially hazardous noise exposures does not insure a noise‑induced hearing loss will not occur. Every individual included in the Hearing Conservation Program must be thoroughly indoctrinated concerning undesirable effects of noise. This indoctrination should be comprehensive enough so that each person becomes his own supervisor. For instance, noise control may be exercised during all work activities, but, a person may still acquire a noise‑induced hearing loss due to unprotected hazardous noise exposure not associated with work. Examples would be sporting activities, such as skeet shooting, hobbies such a metal or wood working, and leisure activities such as loud music and the use of headphones.

It is ironic, but a man who routinely works in extremely hazardous noise environments will not acquire a hearing loss because of the use of hearing protection. Yet, he will allow himself to be exposed to less intense, but still hazardous, noise during off‑duty activities that subsequently may cause a loss of hearing.

Results from extensive research clearly emphasize the fact that noise does not have to elicit pain or even discomfort for it to cause permanent hearing loss. This particular kind of noise constitutes the largest range of exposures which eventually cause permanent sensorineural type noise‑induced losses.

Individuals must know areas and duties where potentially hazardous noise are encountered. It is important to monitor hazardous noise exposure locations.

**Possible areas of hazardous noise exposures:**

* Carpenter shops (to include wood hobby shop).
* Welding/sheet metal shop.
* Areas where pumps and other motor driven equipment are located.
* Places where electric generators are located (immediate area).
* Structural repair shops.
* Machine shops.
* Aircraft ground equipment operation.
* Metals processing shops.
* Pneumatic equipment.
* Firing ranges.
* Printing machine sections.
* Computer equipment sections.
* Vehicle maintenance areas (include auto hobby shops).
* Packing and crating sections.
* Aircraft maintenance training areas.
* Electrical laboratories.
* Power generating plants.
* Areas in the immediate vicinity of taxiway and flight lines.
* Sound/Music Amplifiers.
* Close to internal combustion engines.
* Gas Powered Lawn Maintenance equipment (Mowers, Edgers, Trimmers.)
* Heavy Construction Equipment (Dozers, Earth Movers.)

Hearing Protective Devices

Noise induced hearing loss can be prevented by limiting exposure. When it is impossible or impractical to eliminate or control the noise (e.g., jet aircraft, jackhammer, etc.) resort to personal protective equipment. Personal protective devices are designed and available to protect exposed individuals. All personnel who routinely encounter potentially hazardous noise should be issued insert type earplugs. In many instances, noise muffs may be preferred as the most practical type of device. When the muff is the preferred item, earplugs should also be issued. In the event the muff is misplaced or damaged, the earplugs provide backup protection.

For your company, the following must be completed:

* List types of operations requiring ear protection.
* List types of approved ear protection fore each operator.
* List where ear protection is to be worn.

| **DECIBEL CHART** |
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| **Danger Level** | **dB** | **Source** |
| Extreme danger (painful) | 155140120 | Rifle blast; close-up jet engine; nearby sirenShotgun blast; drag strip; nearby jet engineJet airport; some electronic music, rock drill |
| Probable permanent hearing loss | 115-125110-115 90-100 90-95 | Drop hammers; chipping hammersPlaners; routers; sheet metal speed hammersSubway; weaving mill; paper-making machineScrew machines; punch press; riveter; cut-off saw |
| Possible damage | 80-958065-7570605045-5020-30150 | Spinners; looms; lathesHeavy traffic; plate millCopy room; noisy printerBusy streetNormal speechAverage officeLow conservationQuiet city apartment; whisper; comfortable sleeping levelAverage threshold of acuity; leaf rustlingThreshold of acute hearing (0 dB is 0.0002 dyne per sq cm) |
| Sustained exposure to dB above the upper levels may cause vibration of cranial bones, blurred vision, even weakening of body muscular structure. Frequencies of 500-2000 Hz are the most critical to noise-induced hearing loss. |