

# **Yale University**

*Environmental Health and Safety*

## **NOISE & HEARING CONSERVATION PROGRAM**



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## **Section 1. Noise and Hearing Conservation Program**

### **1.1 Introduction**

Yale University's Noise and Hearing Conservation Program is designed to prevent hearing loss from occupational noise exposure. This program follows the requirements of The Occupational Safety and Health Administration's (OSHA) Hearing Conservation Standard, and the recommendations of the American Conference of Governmental Industrial Hygienists (ACGIH) and the National Institute of Occupational Safety and Health (NIOSH). Under this program, Yale University provides employees with protection against the effects of noise exposure when sound levels exceed an 8-hour time weighted average (TWA) of 85 decibels (A-scale (dBA), slow response). Administrative and/or engineering control measures will be taken initially to reduce noise levels as low as feasible. If these controls fail to reduce the noise to within acceptable limits, personal protective equipment will be provided by Yale University and used by the employee. Under OSHA's requirements, whenever employee noise exposures equal or exceed an 8-hour TWA of 85 dBA (action level), the employer must develop and administer a Noise and Hearing Conservation Program. Yale University's program consists of five parts: exposure monitoring, audiometric testing, hearing protection, employee training, and record keeping.

### **1.2 Responsibilities**

Various Yale University departments and employees have responsibilities under this program:

#### 1. Environmental Health and Safety

- Preparing, reviewing, and periodically revising this program.
- Providing supervisor and employee training.
- Monitoring and evaluating employees for noise exposure by job classification.
- Maintaining records of exposure measurements.
- Coordinating record keeping and notification with the Employee Health Office.

#### 2. Employee Health Office

- Coordinating annual audiometric testing for affected personnel.
- Maintaining audiometric testing records.

#### 3. Supervisors

- Providing new employees with informal on-the-job training about high noise environments, personal protective equipment requirements, and this Program.
- Notifying the Environmental Health and Safety and Employee Health Offices about workplace conditions and potentially affected employees.
- Making information and training materials available to potentially affected employees.
- Supplying hearing protection devices to affected employees free-of-charge.
- Requiring affected employees to wear hearing protectors.
- Ensuring that affected employees receive annual audiogram testing and attend required training.

#### 4. Affected Employees

- Observing the procedures and requirements outlined in this Program.
- Attending training sessions and obtaining audiometric testing.
- Wearing hearing protection as required.
- Notifying supervisors of changes in the workplace that could change noise exposures.

### **1.3 Exposure Monitoring**

Depending upon the work location and frequency of operations, noise exposure monitoring will be conducted with area sound level measurements, personal dosimetry, or a combination of these techniques. A sampling strategy will be selected to permit identification of areas and employees likely to be exposed to noise levels at or above the action level. In general, monitoring results will be extended to all members of the particular job title or function under assessment unless work operations indicate that only certain employees in the group are exposed.

Measurements will be made with calibrated equipment operated by trained personnel from Environmental Health and Safety. Monitoring will be repeated whenever any changes in the process, equipment or controls may increase noise exposures. This will be done to determine the adequacy of hearing protectors being used, and to determine whether new employees or job functions will be required to be included in this Program. Employee noise exposures will also be reassessed periodically. Employees will be notified of the results of all exposure monitoring.

### **1.4 Audiometric Testing**

The Employee Health Office manages the audiometric testing component of the Noise and Hearing Conservation Program. The purpose of audiometry is to determine whether or not hearing conservation efforts are effective. Audiometric testing will be made available to those employees whose job titles are included in the Program. Baseline audiograms will be established within six months of an employee's first exposure at or above the action level and annual audiograms will be offered thereafter. Individuals will be notified in writing by the Employee Health Office within 21 days when an audiogram indicates a standard threshold shift (STS). If this hearing loss is determined to be work related, the individual will be required to wear hearing protection, will be re-trained in their use and care, and will be referred for a clinical audiological evaluation or examination if appropriate. If subsequent audiometric testing indicates that this STS is not persistent, the individual shall be informed of this and hearing protection requirement may be discontinued if exposures are less than 85 dBA.

### **1.5 Hearing Protection**

Hearing protectors will be made available, free-of-charge, to all employees exposed or likely to be exposed to noise levels at or above the action level (8-hr. TWA 85 dBA). As a precaution, hearing protection will be required for all who work in areas where noise levels exceeds the 8-hr TWA 85 dBA action limit. Double hearing protection is required at 100dBA 8-hr TWA. Regardless of duration of exposure, Yale EHS strongly recommends that employees wear hearing protection when entering areas or operating equipment with sound level measurements  $\geq 85$ dBA. EHS also recommends that employees wear double hearing protection when entering areas or operating equipment with sound level measurements  $\geq 100$ dBA. Employees are trained on these recommendations.

Hearing protectors must provide a noise reduction rating sufficient to attenuate the noise below the action level. The choice of hearing protector style will be made by consultation between supervisors and Environmental Health and Safety, with employees given the opportunity to select their hearing protectors from a variety of suitable types. Training from both supervisors and Environmental Health and Safety will provide employees with information about proper fitting and use of all hearing protectors.

## **1.6 Training and Information**

Annual training is required for all employees exposed to noise levels at or above the action level. The training course covers the following areas:

- OSHA's Noise Standard and Yale University's Noise and Hearing Conservation Program;
- Overview of the hazards associated with excessive noise exposure;
- Purpose, characteristics, advantages, and disadvantages of various hearing protectors;
- Selection, fitting, and care of protectors, and;
- Audiometric testing.

A copy of the complete training course is available in the Environmental Health and Safety office. A copy of the Noise and Hearing Conservation Handout/Poster is available in Appendix A. Annual noise training may include the above topics in less depth than the initial Noise and Hearing Conservation training course. Copies of OSHA's Noise Standard are included in Appendix C and are available to affected employees or their representatives by contacting Environmental Health and Safety. This Standard is also available on OSHA's Web site at [www.osha.gov](http://www.osha.gov).

## **1.7 Record Keeping**

Environmental Health and Safety will maintain employee exposure measurements and training records for at least two years. Records of audiometric test results will be kept by the Employee Health Office for the duration of the affected employee's employment. Audiometric records include the following information:

- Name and job classification of the affected employee;
- Date of audiometric testing;
- Examiner's name;
- Date of latest calibration of audiometer.

## **1.8 Signs and Postings**

Workplaces where the noise level exceeds 85 dBA will be posted with signs noting a high noise environment and the requirement to wear hearing protection.

## **Section 2. APPENDICES**

**Appendix A. Noise and Hearing Conservation Poster/Handout**

**Appendix B. 29 CFR 1910.95 Occupational Noise Exposure Standard**



**Appendix A.**  
Noise and Hearing Conservation Poster/Handout

## NOISE AND HEARING CONSERVATION

Noise induced hearing loss normally takes place gradually, with no warning symptoms and no external signs of damage, making it difficult for you to know that this is occurring. It is usually caused by exposure to increased sound levels over a period of time.

This type of hearing loss is preventable and it is rarely too late to intervene. Although hearing protection will not bring back lost hearing, it will stop further damage from occurring.

Hearing loss will affect all areas of your life. It not only affects your work life by impairing your ability to detect or discriminate warning signals and by limiting your ability to hear clearly in meetings and other group settings, it also affects everyday interactions such as speaking and listening on the telephone or in places with higher background noises such as restaurants.

Hearing protectors used at Yale include earmuffs and formable foam style earplugs. Both are effective at reducing noise levels if used correctly. Some of the advantages and disadvantages of each type of protector are listed in the following table.

Type	Advantages	Disadvantages
Ear Muffs	<ul style="list-style-type: none"> <li>❖ Offer more consistent protection</li> <li>❖ Usually last longer than ear plugs</li> </ul>	<ul style="list-style-type: none"> <li>❖ The protection level is decreased when wearing eye/safety glasses because the muff seal around the ear is broken by the eyeglass temple piece</li> <li>❖ Can be uncomfortable to wear for long periods in hot/humid environments</li> </ul>
Formable Ear Plugs	<ul style="list-style-type: none"> <li>❖ Can be worn with glasses</li> <li>❖ More comfortable in hot/humid environments</li> <li>❖ Offer higher attenuation than most muffs</li> </ul>	<ul style="list-style-type: none"> <li>❖ Must seal well/fit properly to ensure adequate protection</li> </ul>

Each ear plug or muff has a noise reduction rating (NRR) which is identified on their boxes. The wearing of hearing protection should be used to bring noise levels down below 85dBA. Sound level surveys have been conducted in all high noise areas under the Yale University Noise and Hearing Conservation Program. This information should be used to evaluate whether the hearing protectors you are wearing are effective. For added assurance, OSHA requires that 7dBA be subtracted from the manufacturer's NRR rating. It is also recommended that a 50% safety factor be added to this equation. Therefore, if the NRR of the hearing protectors is advertised as 25NRR, the actual NRR is  $(25 - 7)/2 = 9$  dBA. If the noise level is 90 dBA, the hearing protectors will reduce it to  $90 - 9 = 81$ dBA. In areas with noise levels at or above 100 dBA, both ear plugs and muffs should be worn to ensure adequate protection.

Foam earplugs are disposable and should be discarded after each use. Earmuffs should be kept clean and stored in a sealed bag away from a dirty work area.

Audiometric testing is conducted by the Employee Health Office on an annual basis. These tests are important to determine whether noise-induced hearing loss is beginning to occur and to catch it early, before the damage becomes too severe.

### **REMEMBER: NOISE-INDUCED HEARING LOSS IS PREVENTABLE!**

The OSHA noise standard, 1910.95 is available from EHS and is also on the OSHA web site at [www.osha.gov](http://www.osha.gov).

Yale University's Noise and Hearing Conservation Program is also on the web at [ehs.yale.edu](http://ehs.yale.edu). Please contact Environmental Health & Safety (203-785-3550) with any questions.



**Appendix B.**  
**29 CFR 1910.95 Occupational Noise Exposure Standard**

[www.osha.gov](http://www.osha.gov)

### **Section 3. References**

References are located in the Environmental Health and Safety office

- Noise Affected Populations/Job Titles
- Contacts for Affected Populations