Yale *Environmental Health & 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 (HCP) is designed to prevent hearing loss from occupational noise exposure. The provisions in this program meet or exceed the regulatory requirements outlined by OSHA's Occupational Noise Exposure standard, 29CFR1910.95.

Yale University's Hearing Conservation Program consists of five parts: exposure monitoring, audiometric testing, hearing protection, employee training, and record keeping. Each of these will be further detailed in this written program.

Under Yale's HCP, whenever employee noise exposures equal or exceed the American Conference for Governmental Industrial Hygienists (ACGIH) 8-hour TWA of 85dBA (referred to as the TLV), during at least one workday per year, employees in affected job categories will be enrolled in the Program.

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 TLV. In general, monitoring results will be extended to all members of a 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.

Environments containing equipment that produces potentially hazardous noise will, wherever it is technologically and economically feasible, be modified using engineering controls to reduce noise to acceptable levels. Where engineering controls are not feasible, administrative controls and/or the use of hearing protective devices (HPDs) will be employed.

Employees will be notified of the results of all exposure monitoring. These results may be presented to employees showing the calculated results using the ACGIH 3-decibel doubling, as well as OSHA's 5-decibel doubling as a comparison, both of which have an 80-decibel threshold.

Noise exposure monitoring results may be compared to the following 8-hour TWA's; OSHA's Action Limit (85dBA), OSHA's PEL (90dBA), and ACGIH's TLV (85dBA). Sound pressure is measured in decibels, which is a logarithmic scale. Because of this, an individual's monitored results may be displayed in the form of a dose percentage to help understand the severity of an exposure. The dose percentages are based off the OSHA PEL (for compliance) and/or ACGIH TLV (more protective for those monitored). This information is presented for comparison purposes, but inclusion in the HCP is based on ACGIH to be as protective as possible.

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 hearing conservation efforts are effective. Audiometric testing will be made available free of charge 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 continue to wear hearing protection devices (HDP) in all areas with sound level measurements of 85dBA or greater, will be re-trained in the use and care of HPD, 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 85dBA.

Hearing screenings (audiograms) for employees in the Yale Hearing Conservation Program are scheduled through the Yale Hearing and Balance Center. To schedule, please call 203-785-5430 and inform them that you are scheduling a Yale University OSHA hearing test. These tests are completed at no cost to the employee. Questions regarding hearing screenings should be directed to Yale's Employee Health Office (203-432-7978).

1.5 Hearing Protection

Hearing protectors will be made available, free-of-charge, to all employees exposed to, or likely to be exposed to, noise levels at or above the TLV (8-hr. TWA 85dBA). Regardless of duration, hearing protection will be required for all who work in areas where noise levels exceed 85 dBA or when working with equipment that has been recorded over 85dBA. Double hearing protection is required in areas that exceed 100 dBA.

Hearing protectors must provide a noise reduction rating sufficient to attenuate the noise below the TLV. 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 the 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 TLV. The training course covers the following areas:

- OSHA's Occupational Noise Exposure Standard (29 CFR 1910.95), ACGIH's TLV for noise, 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 hearing 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 Occupational Noise Exposure Standard are included in Appendix B 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.

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. Workplaces where the noise level exceeds 100 dBA will be posted with signs noting the requirement to wear double 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 when used correctly. Some of the advantages and disadvantages of each type of hearing protector are listed in the following table.

Type	Advantages	Disadvantages
Earmuffs	❖ Offer more consistent protection ❖ Typically are reusable and last longer than ear plugs	❖ The protection level can decrease when the muff seal around the ear is broken by the eyeglass/safety glasses or hair/jewelry ❖ Can be uncomfortable to wear for long periods in hot/humid environments
Formable Ear Plugs	❖ Can be worn more effectively with glasses ❖ More comfortable in hot/humid environments ❖ Offer higher attenuation than most muffs	❖ Must seal well/fit properly to ensure adequate protection ❖ Most are not designed to be reusable

Each ear plug or muff has a noise reduction rating (NRR) which is identified on the manufacturer packaging. Hearing protection should be worn to reduce noise levels below 85dBA. Sound level surveys have been conducted in high noise areas under the Yale University Noise and Hearing Conservation Program. This information should be used to evaluate whether the hearing protectors being worn 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 = 81dBA. 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 dirty work areas.

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.

Yale University's Noise and Hearing Conservation Program is also on the web at 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

Section 3. References

References are located in the Environmental Health and Safety office

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