



**WILLIAM  
& MARY**

CHARTERED 1693

# ENVIRONMENTAL HEALTH & SAFETY OFFICE

Hearing Conservation Program	
<b>Effective Date:</b> October 9, 2009	<b>Revision Date:</b> March 2, 2020
	<b>Supersedes:</b> March 3, 2015

## I. Scope

- A. This program applies to all William & Mary employees exposed to noise levels at or above a time weighted average of 85 decibels (dB), during an 8 hour work shift.
- B. The Departments that may be at risk to elevated noise levels include the following:
  - Facilities Maintenance Employees
    - i. HVAC
    - ii. Plumbing
    - iii. Grounds
    - iv. Utility Plant
    - v. Maintenance Contracts
    - vi. Fire Protection
    - vii. Electricians
  - Identified Employees in the following departments:
    - i. Athletics
    - ii. Campus Recreation
    - iii. Biology
    - iv. Art
    - v. Physics
- C. William & Mary’s Hearing Conservation Program consists of the following components:
  - Noise Level Monitoring
  - Audiometric testing
  - Hearing Protection
  - Employee Training
  - Recordkeeping

## II. Purpose

The purpose of this program is to protect workers from noise induced hearing loss. This program provides guidelines for employees exposed to occupational noise and complies with the Occupational Health and Safety Administration (OSHA) Noise Exposure Standard 29 CFR 1910.95.



### III. Definitions

Action Level: The level of noise exposure at which an employee must be enrolled in the Hearing Conservation Program; noise exposures at or above a time weighted average of 85 decibels (dB), during an 8 hour work shift.

Audiogram: A graphic record of hearing ability of various sound frequencies that is used to measure hearing loss.

Audiometric Testing: A series of hearing tests used to measure hearing over time and detect any changes that may have occurred. The testing also establish a baseline hearing threshold that is compared to subsequent exams to determine if hearing loss has occurred.

Audiologist: A person who is trained to perform hearing testing and evaluate hearing loss.

A-Weighted: The A weighted decibels, abbreviated dBA, expresses the relative loudness of sounds in air as perceived by the human ear. The A weighting approximates the range of human hearing as it filters out lower frequency noises, which are not as damaging as the higher frequencies.

Baseline Audiogram: The audiogram against which subsequent audiograms are compared.

Decibel (dB): A unit of measurement of the intensity of a sound wave (loudness).

Dosimeter: A measuring instrument that measures total noise exposure over time. A dosimeter is often worn by the employee to measure individual noise exposure.

Earmuffs: A type of personal protective equipment that covers the entire outer ear. Earmuffs consist of two ear coverings connected by a headband.

Earplug: A common type of personal protective equipment that is placed into the ear canal to prevent excessive noise from entering the ear.



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Frequency: A sound's pitch measured in hertz (Hz).

Hearing Conservation Officer: The designated individual from the Environmental Health, & Safety office responsible for overseeing the Hearing Conservation Program and will review and update the program annually.

Hearing Loss: A reduced ability to hear sounds.

Hearing Protection Devices (HPD's): Personal protective equipment that is designed to be worn in the ear canal or over the ear to reduce the sound level reaching the ear drum.

Hertz (Hz): Unit of measurement of frequency, numerically equal to cycles per second.

Noise: Any unwanted sound. Noise can be loud or soft.

Noise Reduction Rating (NRR): The Noise Reduction rating of hearing protection devices indicates the theoretical amount of reduction of noise levels that can be achieved if the hearing protection device is worn correctly. This rating is shown on the packaging of the hearing protection device.

Revised Baseline: An annual audiogram may be substituted for the baseline audiogram when, in the judgement of the audiologist, otolaryngologist, or physician who is evaluating the audiogram.

Sound: The sensation perceived by the sense of hearing.

Sound Level Meter: An instrument for the measurement of noise in sound level surveys.

Standard Threshold Shift (STS): An average shift from the baseline measurement in either ear of 10 decibels or more at 2000, 3000, 4000 Hertz.

Time Weighted Average: A measure of noise exposure that is an average of varying levels of noise experienced in a given eight-hour workday.



#### **IV. Responsibilities**

- A. Hearing Conservation Officer: The designated individual from the Environmental Health, & Safety office responsible for overseeing program and will review and update the program annually. Schedules the annual audiograms via mobile van or at a specified occupational health physician. Conducts area noise monitoring. Develops and administers the training on an annual basis. Communicates any standard threshold shifts to Human Resources as an OSHA recordable injury, and works alongside the supervisor to develop specific mitigation for the employee with regards to hearing protection.
- B. Supervisor: Responsible for identifying the need for an employee to be enrolled in the Hearing Conservation Program. The supervisor accomplishes this by indicating potential exposure to high noise tasks on the Human Resources Physical Hazards Worksheet; applicable to each position they supervise. Mitigates noise exposure to all employees, specifically any employee that has a documented threshold shift as a result of the annual audiogram.
- C. Employee: Responsible for attaining his/her annual audiograms, attending the annual training, and utilizing hearing protections as require per job tasks and in posted areas.
- D. Human Resources: Records a Standard Threshold Shift due to occupational noise exposure on the OSHA 300 log.

#### **V. Program**

- A. Noise Level Monitoring
  - 1. The noise level monitoring program is in place to provide an ongoing means of determining potential employee exposure to noise and protect employees based on excessive exposure.
  - 2. Monitoring of personal noise exposure levels shall be conducted to accurately identify employees who are exposed to noise levels at or above 85 dBA, average over eight working hours.
  - 3. The Hearing Conservation Officer utilizes a combination of an Industrial Hygiene Contractor and the Environment, Health and Safety (EH&S) Staff to determine employee exposure to noise.
  - 4. Area noise monitoring is conducted when levels can potentially exceed 85 dBA in a location such as a mechanical room, machine shop, or other areas where excessive noise is generated.
    - a. If levels exceed 85 dBA, signage is posted that requires the use of hearing protection and ear plugs are supplied at the location.
    - b. If levels exceed 100 dBA, signage is posted requiring the use of double hearing protection.



5. Upon completion of area noise monitoring, noise dosimetry shall be conducted on employees that have the potential to be exposed to levels of noise in excess of an action level of 85 dBA or greater.
6. The Hearing Conservation Officer provides a report to the affected employees and their supervisor with a memo showing the results of their noise monitoring.
7. Monitoring shall be repeated whenever a change in the process, equipment, or controls is suspected of increasing noise exposures to the extent that additional employees may be exposed to noise levels at or above 85 dBA.

**B. Audiometric Testing**

1. Audiometric testing monitors the sharpness or acuity of an employee's hearing over time, and provides an opportunity for William & Mary to educate employees about their hearing and the need to protect it.
2. A baseline audiogram is the reference audiogram against which subsequent audiograms are compared.
  - a. Baseline audiograms shall be conducted for new hires that will work in areas with high level of noise within six months of their first exposure.
  - b. Mobile test van exception – allows for the baseline audiogram to be obtained within 1 year of an employee's first exposure at or above the action level.
3. Audiometric testing is repeated annually in order to identify changes in hearing ability.
  - a. High Levels of non-occupational noise exposure need to be avoided during the 14 hour period immediately preceding the audiometric testing.
4. A work history/hearing questionnaire is required on each employee tested and completed annually.
5. Audiometric testing shall be conducted and reviewed by a trained physician, or a licensed or a certified audiologist.
6. Annual audiograms are compared to baseline audiograms to determine whether the audiogram is accurate and to determine whether the employee has a change in hearing ability; a standard threshold shift (STS).
  - a. STS is defined as an average shift in either ear of 10 dBA or more at 2,000, 3,000, and 4,000 Hertz.



7. If an employee has a STS when exposed to noise at or above the action level, the following steps will be taken:
  - a. Employees shall be notified in writing, within 21 days from the time the determination is made that their audiometric test results showed a STS.
  - b. A retest shall be obtained within 30 days and the results of the retest will be considered as the annual audiogram.
    - i. If the second audiogram confirms an STS has occurred, the employee and his/her supervisor will be notified in writing.
    - ii. A meeting with the Hearing Conservation Officer will be conducted to:
      - a. Explain the results of the test,
      - b. Review the employee's job practices,
      - c. Retrain the employee in the use of hearing protectors.
  - c. All documented employee STS will be recorded on the OSHA Form 300 Injury and Illness Log as required by 29 CFR 1904.7.
  - d. A persistent STS is an STS that is confirmed on a subsequent audiogram. A revised baseline may be substituted for the ear which registered as having a STS.

C. Hearing Protection

1. HPDs shall be readily available at no cost to all employees exposed to an 8-hour time-weighted average of 85 dBA or greater.
2. Made available to employees via warehouse stock.
3. HPDs must be worn by:
  - a. All employees exposed to an 8-hour TWA of 85 dBA or greater.
  - b. Any employee entering an area in which hearing protection is required.
  - c. Any employee performing a task where hearing protection is required.
  - d. For new employees, any period exceeding 6 months from the time the employee is first exposed to high noise of 85 decibels or more, until the employee receives his/her baseline audiogram.
  - e. All employees that have a documented standard threshold shift on the annual audiogram.



4. The Hearing Conservation Officer ensures adequacy of the hearing protection attenuation for the specific noise environments in which the protector will be worn, by using the Noise Reduction Rating (NRR) value to determine the protection provided by a hearing protector.
  - a. In lieu of the NRR, the EH&S Office may evaluate the adequacy of hearing protector attenuation by using one of the three methods developed by the National Institute for Occupation Safety (NIOSH) described in 29 CFR 1910.95 [Appendix B](#).

**D. Employee Training**

1. Annual training is required for all employees who are exposed to noise at or above an 8-hour TWA of 85 dBA; employees enrolled in the Hearing Conservation Program.
2. EH&S will update the training material to be consistent with changes in the protective equipment and work processes by reviewing applicable standards on an annual basis.
3. The Hearing Conservation Officer ensures employee participation in the hearing protection training program for any personnel who are subject to work in high noise environments.
4. The training will inform employees of the following:
  - a. The purpose and benefits of the hearing conservation program
  - b. Hearing protection requirements and proper use
  - c. Audiometric testing and results
  - d. Standard threshold shifts
  - e. Noise Monitoring
  - f. Recordkeeping



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E. Recordkeeping

1. Recordkeeping is the means by which hearing levels are traced and assessed over a period of years, pursuant to 29 CFR 1910.95(m).
2. The Hearing Conservation Officer maintains accurate records of all employee audiometric test records in a secure database that includes:
  - a. Employee name and job classification
  - b. Date of audiogram
  - c. Examiner's name
  - d. Date of last acoustic or exhaustive calibration the audiometer
  - e. Memo signed by the employee stating the summary of the employee's most recent noise exposure assessment.
3. Noise exposure monitoring records are maintained in a secured database by the EH&S Office.
4. All records are available upon request to employees, former employees, and representatives designated by the individual employee.