1.0 INTRODUCTION

As part of the Weill Cornell Medical College (WCMC) Environmental Health and Safety (EHS) Program Manual, this Hearing Conservation Program recognizes the existence of work tasks, equipment and environments that may cause exposures to excessive occupational noise levels. The Occupational Heath and Safety Administration (OSHA) under its Occupational Noise Exposure standard (29CFR1910.95) mandates establishing policies and procedures for employees who are exposed to noise at levels which may result in a loss of hearing. This document serves as the WCMC formal written program. This program will be reviewed routinely by EHS personnel to address its efficacy and maintain provisions as deemed necessary.

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Appendix A- Spaces with Identified High Noise Levels

Appendix B- Hearing Conservation Program Decision Tree
3.0 OBJECTIVE

The objective of the Hearing Conservation Program (HCP) is to provide managers, supervisors and employees with guidance in complying with the HCP and all applicable rules and regulations, as well as to protect the hearing of those employees who could potentially be exposed to occupational noise levels in excess of 85 dBA.

4.0 APPLICABILITY

This program applies to all personnel at WCMC who may have an occupational noise exposure which is equal to or greater than the Action Level (AL) of 85 dBA for an 8-hour time-weighted average (TWA). Where employees are confirmed to have exposures above the AL, these exposures shall be reduced through the implementation of engineering, administrative or Personal Protective Equipment (PPE) controls as specified in this manual. No employee shall be exposed to noise above the Permissible noise Exposure Level (PEL) of 90 dBA TWA without the use of personal hearing protection.

NOTE: Noise levels below 85 dBA are considered nuisance noise. While these levels may cause increased stress levels, distractions or discomfort, they are not expected to result in permanent hearing loss. Where nuisance level noise is identified, EHS will advise the Department of feasible means to reduce sound levels in order to provide a workplace that is as comfortable and productive as possible.

5.0 ROLES AND RESPONSIBILITIES

5.1 ENVIRONMENTAL HEALTH AND SAFETY (EHS)

- Administer and periodically review the Hearing Conservation Program (HCP).
- Conduct noise monitoring in areas of concern.
- Conduct personnel exposure monitoring utilizing a noise dosimeter on individuals with potential exposures above the action level.
- Identify areas, equipment or processes that require noise abatement and/or posting.
- Provide comprehensive initial and annual training to all employees included in the HCP.
- Advise all parties (e.g., Departments, Capital Planning, Engineering & Maintenance) on noise reduction through administrative and/or engineering controls.
- Identify appropriate hearing protection equipment where required.
- Maintain a record of employee noise exposures.
- Maintain a list of all titles/tasks included in the HCP.
- Notify Departments of titles and/or tasks that must be included in the HCP.
5.2 WORKFORCE HEALTH AND SAFETY (WHS)

- Provide initial (baseline) and annual audiometric testing of employees who are in the HCP.
- Interpret audiometric test results.
- Evaluate and compare current audiograms with employee’s baseline audiogram to determine if a Standard Threshold Shift (STS) has occurred.
- Review problem audiograms and determine if further evaluation is required.
- Refer employees for clinical audiological evaluation or an otological examination if additional testing is necessary.
- Retest employees who have experienced an STS within thirty (30) days. If the STS is suspected of being related a temporary clinical condition such as an infection, the employee must be retested as soon as clinically cleared. Use the results of the test as the annual audiogram.
- Review the results of the audiogram with the employee.
- Maintain audiometric test records within the employee’s health file.
- Ensure audiometric measuring instruments, audiometric test rooms and acoustic calibration of audiometers is in accordance with Appendices C, D, and E, respectively of 29 CFR 1910.25.
- Provide copies of audiograms to Environmental Health and Safety.
- Review HCP with EHS annually.

5.3 DEPARTMENTS

- Notify EHS of potentially excessive noise-generating tasks conducted by employees and when new noise-generating sources are introduced.
- Minimize noise using administrative and engineering controls.
- Ensure that employees whose titles/tasks are in the HCP receive training within six months of this inclusion and annually thereafter.
- Ensure that employees whose titles are in the HCP receive baseline audiometric testing within six months of this inclusion and annually thereafter.
- Ensure 14 hours of “quiet time” prior to audiograms.
- Provide employees with hearing protection devices appropriate for their exposure.
- Offer a variety of approved hearing protectors.
- Post hazard signs in areas identified as having excessive noise.
- Notify EHS of changes in tasks, processes, equipment or engineering / administrative controls which would require a re-evaluation of an employee’s exposure.
- Notify employees of the results of exposure monitoring where the exposure was above the action level.
5.4 PRINCIPLE INVESTIGATORS (PI’S), MANAGERS AND SUPERVISORS

- Notify EHS of work areas/tasks suspected of having excessive noise problems. Excessive noise problems are those that interfere with normal speech.
- Ensure that persons exposed wear hearing protection in areas posted as having high noise or when performing tasks known to cause excessive noise exposures.
- Ensure that hearing protection is provided to employees and used when required.
- Notify EHS or the Department of areas of concern or changes in tasks, processes, equipment or engineering/administrative controls which would require a re-evaluation of an employee’s exposure.

5.5 EMPLOYEES

- Report noise-related concerns to immediate supervisor. If no action is taken, employees should report concerns to EHS directly.
- Attend annual HCP training.
- Receive audiometric testing as scheduled.
- Wear the appropriate hearing protection as required.

6.0 MONITORING

6.1 INITIAL EVALUATION

Upon notification of tasks, processes or equipment that are suspected of having the potential to expose employees to excessive noise levels, EHS will conduct an initial evaluation which may include:

- Determining and comparing employee work locations to those known to contain high levels of noise, such as those listed in Appendix A.
- Measuring area or source noise with a sound-level meter.
- Reviewing equipment specifications or literature to determine noise output levels.
- Reviewing processes or work tasks to identify sources of noise which may be reduced or eliminated.

If the initial evaluation indicates definitively that employees will not be exposed above the action level, EHS will notify the department of these findings and make recommendations as necessary.

6.2 EMPLOYEE EXPOSURE MONITORING

When information indicates that an employee’s exposure may equal or exceed the action level of 85 dBA for an 8-hour TWA assessment, EHS will monitor exposure
levels. Affected employees shall be notified of the results of the monitoring where levels at or above the action level are identified. Monitoring activities may consist of:

- Sound level measurements for locations where the noise level is stationary and expected to be continuous.
- Personal noise dosimetry for work operations which are highly mobile or random in noise level.
- Re-monitoring, if a change in equipment, process or controls increases the noise level to the extent that:
  1. additional employees may be exposed at or above the action level;
  2. the attenuation provided by the hearing protectors used by the employee(s) does not reduce the noise exposure level to 90 dBA for an 8-hour TWA or 85 dBA for an 8-hour TWA for employees who have experienced a standard threshold shift; or
  3. follow-up monitoring if an STS has occurred.
- The opportunity for affected employees to observe the noise measurements during collection.

Should exposure monitoring indicate that an employee is exposed above the AL, EHS will provide the Department with a report which includes details of the activities monitored, recommendations for the reduction of noise levels, and the requirement to include employees in the HCP. If follow-up monitoring determines that an employee is no longer required to be in the HCP, the employee will remain in the program until such time as they receive an audiometric test.

### 7.0 TRAINING

Training must be provided within six months of an employee’s inclusion in the HCP and annually thereafter. Departments must coordinate training with EHS who will provide it to all employees. During training, each employee will be informed of the following:

- Effect of noise on hearing.
- Purpose of hearing protection; the advantages, disadvantages, and attenuation of various types of hearing protection; instruction on selection, care and use of hearing protection.
- Purpose of audiometric testing and explanation of the test procedure.
- Updated information consistent with changes in protective equipment and work process.

### 8.0 AUDIOMETRIC TESTING

Each employee in the HCP shall be included in an audiometric testing program administered by Workforce Health and Safety including baseline and annual audiometric testing. When scheduling employees for testing, the Department must ensure that employees are:
- Scheduled for baseline audiometric testing within six (6) months of hiring or conformation of their exposure to noise levels at or above the action limit.
- Not exposed to occupational noise for at least fourteen (14) hours prior to a scheduled baseline audiometric test by either scheduling the testing immediately after an employee’s regular day off, or by ensuring they wear appropriate hearing protection.
- Notified of the requirement for 14 hours of “quiet time” prior to being tested.

### 9.0 NOISE EXPOSURE CONTROL

#### 9.1 ENGINEERING CONTROLS

Wherever feasible, employee noise exposures should be reduced below the AL. The following noise control measures should be implemented:

- Planned equipment purchases or modifications should be reviewed by the purchasing Department or the Capital Project Manager to determine if the equipment will have an adverse effect on workplace noise levels.
- New equipment design specifications, when feasible, should limit the noise generated by the equipment to 85 dBA or less.
- Where purchases of new equipment, or modification or use of existing equipment will result in generation of noise levels above 85 dBA, the Department must consider the implementation of engineering controls such as acoustical barriers, source enclosure, vibration isolation, or exhaust muffling in order to reduce to noise levels in the work environment.
- As noise levels decrease with distance, noise-generating equipment should be placed away from the majority of employees wherever practical.

#### 9.2 ADMINISTRATIVE CONTROLS

Where engineering controls are either not feasible or are insufficient in reducing employee exposure below the PEL, Administrative Controls should be considered. Administrative Controls are changes in the work schedule or operational modifications that change the deployment of personnel to hazardous areas at peak noise producing times. Examples of Administrative Controls include:

- Rotating workers to reduce the time of exposure or increasing the distance between the worker and the noise source.
- Restricting access to areas with high noise levels to essential employees or reducing the amount of time an employee is required to be in the area.

### 10.0 PERSONAL PROTECTIVE EQUIPMENT – HEARING PROTECTORS

Where engineering and administrative noise control measures are either not feasible or are insufficient in reducing employee exposures below the PEL, employees must use hearing protectors designed to reduce their exposure below the PEL. Employees whose noise exposure is below the PEL (90 dBA) but above the AL (85 dBA) are not required to wear hearing protection, although it is encouraged.
10.1 **SELECTION**

The following criteria must be considered when selecting hearing protectors:

- Hearing protectors must be assessed and approved by EHS in order to ensure adequate protection.
- Hearing protectors must be provided at no cost to the employee.
- Hearing protectors are generally one of two types: ear plugs, which are designed to fit inside the ear canal, and ear muffs, which are intended to fit over the ear. Employees must be offered a choice of the type of hearing protector they use.
- Reusable hearing protectors must be cleaned following the manufacturer’s directions after each day’s use.
- The Noise Reduction Rating (NRR) must be sufficient to reduce an employee’s exposure to 90 dBA or less and to 85 dBA or less if an employee has experienced an STS.

10.2 **USE AND CARE OF HEARING PROTECTORS**

Hearing protectors are only effective if they are fitted and used properly. Improper use of hearing protectors may result in exposure to excessive levels of noise, skin irritation or ear infections. The following guidelines should be followed when using hearing protection:

- Employees should be fitted and trained by EHS in hearing protection prior to use.
- Disposable ear plugs must be discarded once they become dirty or at the end of a work shift.
- Reusable hearing protectors must be cleaned following the manufacturer’s directions after each day’s use.
- Hearing protectors must be replaced when they are worn, stiff or misshapen.

10.3 **VOLUNTARY USE OF HEARING PROTECTORS**

Employees may desire to wear hearing protection when concerned about the effects of noise in the workplace. Where exposures are not above the AL, but employees elect to wear hearing protection, it is important that employees be both properly fitted and trained in order to prevent injury or infection. While the use of hearing protection is recommended for employees whose exposure is above the AL (85 dBA) but below the PEL (95 dBA), it is not mandatory unless:

- The employee has not received an audiogram and no baseline audiogram has been established.
- A Physician requires the use of hearing protection.
- The employee has experienced an STS.
**NOTE:** The use of personal Walkman-type earphones may generate noise levels that may result in permanent hearing damage. As such, their use is not permitted when working in areas or performing tasks which pose a recognized noise hazard due to the potential cumulative negative effects.

### 11.0 RECORDKEEPING

#### 11.1 EXPOSURE RECORDS
EHS will maintain copies of all exposure-monitoring reports for no less than two years after the date of measurement.

#### 11.2 AUDIOMETRIC TEST RECORDS
Workforce Health and Safety will maintain records of all audiometric tests. These records will be maintained for the duration of employment and will include:
- The name and job classification of the employee.
- The date of the audiogram.
- The examiner's name.
- The Employee's most recent noise exposure assessment.
- Measurements of the background sound pressure levels in audiometric test rooms and the date of the last acoustic or exhaustive calibration of the audiometer will be recorded in a log book and maintained on site.

### 12.0 DEFINITIONS

**Action Level:** An 8-hour time weighted average (TWA) of 85 decibels measured on the A-weighted scale, slow response, or equivalently a dose of 50%. This is the level of sound exposure at which employee participation in the WCMC Hearing Conservation Program is mandatory.

**Audiogram:** A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**A-Weighted Sound Level (dBA):** The weighting of sound levels that represents the function of the human ear.

**Audiometric Testing Program:** The portion of the Hearing Conservation Program that consists of measuring an employee’s hearing threshold to establish a baseline and for subsequent comparisons.

**Baseline audiogram:** The audiogram against which future audiograms are compared.

**Decibel (dB):** Unit of measurement of sound level.

**Dose:** A ratio of noise exposure relative to the noise criterion level of 90 decibels, expressed as a percentage. Ninety decibels represents a dose of 100% over an 8-hour work shift. Eighty-five decibels represents a dose of 50% over an 8-hour work shift. Dose is based on the OSHA 5 dB
exchange rate. Dose may be determined from the equation given in Table 1 for non-continuous noise or estimated from Table 2 based on the TWA.

**Hearing Conservation Program (HCP):** A written program that establishes procedures to ensure the protection of employees from high noise areas or operations in compliance with the OSHA Occupational Noise Regulation 29 CFR 1910.95.

**Noise dosimeter:** An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

**Noise Induced Hearing Loss:** The OSHA recordable occupationally related hearing loss, as defined by 29 CFR 1904.10 and 29 CFR 1904.5, and includes a Standard Threshold Shift (STS) of 10 db, with age correction, averaged over the 2K, 3K, and 4K frequencies from baseline in either ear and a 25 db shift from audiometric zero, in the same ear as the 10 dB STS at the same frequencies.

**Noise Monitoring:** The sampling of noise levels using a sound level meter, octave band analyzer, or personal noise dosimeter.

**Noise Reduction Rating (NRR):** The NNR is the theoretical maximum amount of noise reduction that can be achieved by using a particular hearing protection device.

**Permissible noise Exposure Level (PEL):** The maximum daily noise exposure which may be experienced by employees not using hearing protectors from a continuous 8-hour exposure to a sound level of 90 dBA or equivalent dose of 100%.

**Standard Threshold Shift (STS):** A change in hearing threshold, relative to the most recent audiogram for that employee, of an average of 10 decibels (dB) or more at 2000, 3000, and 4000 hertz in one or both ears and substantiated within 30 days with a follow-up audiogram.

**Time Weighted Average (TWA):** The [equivalent] noise level, in dB, based on an 8-hour exposure time frame. If the noise level is not constant over an 8-hour exposure, then a calculated 8-hour TWA will be made based on the actual exposure.

### 13.0 REFERENCES


## APPENDIX – A

Spaces with Identified High Noise Levels (≥85 dBA)

Date: March, 2008

<table>
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<tr>
<th>Building</th>
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<td></td>
<td>15th Floor</td>
<td>83-88</td>
</tr>
<tr>
<td></td>
<td>B2 Mechanical Room</td>
<td>84-87</td>
</tr>
<tr>
<td></td>
<td>B3 Mechanical Room</td>
<td>85-95</td>
</tr>
<tr>
<td>2. Whitney</td>
<td>9th / Mechanical</td>
<td>90-97</td>
</tr>
<tr>
<td>3. S Building</td>
<td>Roof</td>
<td>95-101</td>
</tr>
<tr>
<td></td>
<td>11th Fl Mechanical</td>
<td>98-105</td>
</tr>
<tr>
<td></td>
<td>5th Fl Mechanical</td>
<td>98-101</td>
</tr>
<tr>
<td></td>
<td>3rd Fl Mechanical</td>
<td>95-102</td>
</tr>
<tr>
<td></td>
<td>Basement Machine Room 0.09</td>
<td>90-95</td>
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APPENDIX B

Hearing Conservation Program / Flow Chart

(Refer to next page)
Hearing Conservation Program
Appendix A / Flow Chart

**Responsible Party**
- Operational Department
- Environmental Health and Safety (EHS)
- Workforce Health and Safety (WHS)
- Employee

**Flow Chart**

1. **Noise concern identified**
   - Contact EHS

2. **Initial evaluation >80 dBA**
   - **YES**
     - Exposure monitoring >85 dBA 8 hr TWA
     - **NO**
     - **NO further action**
   - **NO**
   - **YES
     - Are engineering controls feasible?**
     - **NO**
     - Employee wears hearing protection until controls implemented
     - Controls implemented
     - **REPEAT**
     - **YES**
     - Employee enrolled in HCP
   - **YES**
     - Contact WHS for audiometric testing
     - Conduct baseline audiogram
     - Conduct annual audiogram
     - Repeat training annually
     - Employee Wears Hearing Protection as Instructed
     - EHS re-evaluate controls
     - Was STS confirmed?
     - **YES**
     - Continue audiometric testing annually
     - Conduct baseline audiogram
     - Conduct annual audiogram
     - Repeat training annually
     - Employee enrolled in HCP
     - Was STS detected?
     - **YES**
     - Continue audiometric testing annually
     - Conduct baseline audiogram
     - Conduct annual audiogram
     - Repeat training annually
     - Employee enrolled in HCP
     - **NO**
     - No further action
     - **NO further action**

- If any subsequent change in work or engineering controls, Department must contact EHS