The Washington University Hearing Conservation Program has been established to meet the requirements of The Occupational Safety and Health Administration (OSHA) General Industry Standard “Occupational Exposure to Noise” Part 1910.95. Evidence is well established that worker exposure to noise of sufficient intensity and duration can result in hearing damage.

1.1 PROGRAM ELEMENTS

The primary goal of the Hearing Conservation Program is to reduce, and eventually eliminate to the extent possible, hearing loss due to workplace noise exposures. The program includes the following elements:

- **Noise Level Surveys** - Work environments will be surveyed to identify potentially hazardous noise levels and personnel at risk.
- **Engineering Controls** – Equipment that produces potentially hazardous noise should, wherever it is technologically and economically feasible, be modified to reduce the noise level to acceptable levels.
- **Administrative Controls** – These include work site rotations that limit the time that the employee is exposed to high levels of noise.
- **Personal Protective Equipment** – Where engineering and administrative controls are not feasible, the use of hearing protective devices will be employed.
- **Audiometric Testing** – Periodic hearing testing will be conducted to monitor the effectiveness of the Hearing Conservation Program. Early detection of temporary threshold shifts will allow further protective action to be taken before permanent hearing loss occurs.
- **Education and Training** – An understanding by employees of the permanent nature of noise-induced hearing loss, the University’s Hearing Conservation program, and the employee’s responsibilities under the program are essential for program effectiveness.

The Occupational Safety and Health Administration (OSHA) requirements (29 CFR 1910.95) for permissible noise exposures are shown in the table below.
If the sound levels listed above are exceeded, feasible administrative or engineering controls will be instituted. If these controls fail to reduce the sound levels to within those listed above, hearing protection will be provided and used to reduce the sound levels to an acceptable level. Whenever employee noise exposures equal or exceed an 8-hour time weighted average (TWA) of 85 dBA, slow response, effective hearing conservation measures will be instituted.

SECTION TWO – RESPONSIBILITIES

2.1 – EH&S is responsible for developing, implementing and administering the University’s Hearing Conservation Program, including:

- Identification of work areas and equipment within the University facilities where noise levels equal or exceed 85 dBA
- Identification, through personnel monitoring, of University employees whose noise exposure level equals or exceeds an 8-hour TWA of 85 dBA. Notification of employee exposure measurements is sent to their supervisor and employee medical file
- Annual re-monitoring of identified at-risk employees
- Annual resurvey of work areas and equipment where noise levels exceed 85dBA and areas that have new equipment
- Training of employees on proper use and care of hearing protection devices
- Identification of noise control measures and developing recommendations
- Coordination and scheduling of health and safety training.
2.2 – Administrators, Department Heads, Managers, Supervisors, and Faculty

- Provide work or learning environments that minimize noise to the greatest extent reasonable.
- Provide hearing protection for employees and students where needed
- Request EH&S to evaluate noisy operations
- Ensure that employees exposed to noise above the permissible levels defined above are given training and provided with audiometric exams and hearing protection devices.
- Provide easy access to hearing protection and ensure that employees use such protection where appropriate
- Post areas known to present noise hazards with signs requiring the use of hearing protection

2.3 – Employees and Students

- Wear approved hearing protection devices in posted noise hazard areas
- Maintain hearing protection in sanitary condition and proper working order
- Report any hearing protection problems to the appropriate supervisor
- Report noise hazards to the appropriate supervisor.

SECTION THREE – NOISE EVALUATION AND SURVEILLANCE PROCEDURES

3.1 - Identification of Hazardous Noise Areas

EH&S will identify work areas where noise levels equal or exceed 85 dBA. Records will be maintained by EH&S and updated yearly (or after installation of new equipment) to determine if any alteration in noise levels has occurred. Those areas where noise levels are below 85 dBA will not be routinely monitored. Identification of hazardous noise areas and equipment and any subsequent noise monitoring will be conducted by EH&S.

Signs will be posted at the entrance to any work area where noise levels exceed 85 dBA, requiring anyone entering the area to wear proper hearing protection. Personnel who work in these areas shall have hearing protection supplied to them, shall be instructed in its proper use, and be required to wear this equipment when in these identified areas.

3.2 – Noise Measurements and Exposure Assessments

In order to effectively control noise it is necessary that the noise be accurately measured according to standard procedures and that the measurements are properly evaluated against accepted criteria. All noise monitoring will be conducted in accordance with established standard operating procedures.
The monitoring of employees for noise exposure is made up of two parts; general area monitoring and personnel monitoring. Area measurements are generally obtained first. If noise levels are at or above 85 dBA, personnel monitoring using dosimeters is then performed.

3.2.1 Area Measurements

In a general area survey, measurements of environmental noise levels are recorded using a sound level meter to identify work areas where employee exposures may be above hazardous levels, and where more thorough exposure monitoring may be needed. Area monitoring is conducted using a calibrated sound level meter. Within the area of interest, several different locations will be measured. Typical measurement locations include:

- In the hearing zone at the employee’s normal work location
- Next to the noise source(s)
- At the entrance(s) to the work area
- At other locations within the area where the employee might spend time working

If the noise levels are below 85 dBA on a time-weighted average basis in the area, no further routine monitoring will be required for that area. Should any of the noise measurements equal or exceed 85 dBA, records shall be maintained as to the noise levels recorded, where they were taken, and the source(s) of the noise. These records shall be updated at least once every year (or after installation of new equipment) to determine if any changes have occurred that would warrant re-monitoring of exposed personnel. If any of the measurements equal or exceed a noise level of 85 dBA, employees who work in or near the high noise area or equipment shall have their noise exposure determined through personnel monitoring using dosimeters.

3.2.2 Personnel Monitoring

Determination of the noise exposure level will be accomplished using calibrated noise dosimeters. Each employee to be monitored will have a dosimeter placed on him/her at the beginning of his/her normal work shift with the microphone placed in the “hearing zone”. The dosimeters will be worn for the full duration of the work shift while the employee performs his/her normal work routine. At the end of the work shift, the dosimeter will be removed. Background information will be collected from each employee detailing job description, unusual job activities, etc., for the time period samples. Those employees whose noise exposure equals or exceeds 85 dBA on an 8-hour TWA will be included in the University Hearing Conservation Program.
3.3 – Re-monitoring of Hazardous Noise Areas

All areas where noise levels equal or exceed 85 dBA shall be re-monitored once a year (or after installation of new equipment). Employees who work for extended periods of time (>2 hours) in the high noise areas and where their 8-hour TWA equals or exceeds 85 dBA will be monitored every year to determine their personal noise exposure.

Whenever an employee exhibits a standard threshold shift, as determined by audiometric testing, the employee’s work place shall be re-monitored to identify potential causes and remedial actions.

3.4 – Re-monitoring Due to Changes

Any area with noise levels that equal or exceed 85 dBA shall also be re-monitored whenever a change in production process, equipment, or controls increase the noise exposure such that additional employees are exposed to noise levels at or above 85 dBA on a time-weighted average basis. Areas where the noise levels have dropped below 85 dBA due to alterations in equipment, controls or process changes shall be eliminated from the monitoring program.

SECTION FOUR – NOISE CONTROL METHODS

4.1 – Engineering and Administrative Controls

The primary means of reducing or eliminating personnel exposure to hazardous noise is through the application of engineering controls. Engineering controls are defined as any modification or replacement of equipment or related to physical change at the noise source or along the transmission path that reduces the noise level at the employee’s ear.

Administrative controls are defined as changes in the work schedule or operations which reduce noise exposure. If engineering solutions cannot reduce the noise, administrative controls such as increasing the distance between the noise source and the work or rotation of jobs between workers in the high noise area should be used if possible.

The use of engineering and administrative controls should reduce noise exposure to the point where the hazard to hearing is eliminated or at least more manageable.

4.2 – Personal Protective Equipment

Hearing protection (ear plugs, muffs, etc.) shall be the permanent solution only when engineering or administrative controls are considered to be infeasible or cost prohibitive.
Hearing protection devices are defined as any device that can be worn to reduce the level of sound entering the ear. All personnel shall wear hearing protection devices when they enter or work in an area where the operations generate noise levels of:

- Greater than 85 dBA sound levels, or
- 120 dBA peak sound pressure level or greater

4.2.1 Hearing Protection Performance Information

Hearing protection shall have a Noise Reduction Ratio (NRR) high enough to reduce the noise at the ear-drum to 90 dBA or lower. The maximum sound attenuation obtained by wearing hearing protection devices is limited by individual variations in the shape of the auditory canal as well as bone conduction mechanisms. Even though a particular device may provide outstanding values of noise attenuation, the actual noise reductions may be less because of the noise surrounding the head and body bypassing the hearing protection.

SECTION FIVE – MEDICAL SURVEILLANCE

5.1 – Notification

Upon identification of employees whose 8-hour TWA equals or exceeds 85 dBA, EH&S will recommend to the employee’s Supervisor, in writing, of the need to enroll certain employee(s) in the Hearing Conservation Program. The affected employee(s) will be evaluated by an audiometric professional at Barnes Care. For a period of 24 hours prior to the employee’s appointment at Barnes Care to have their hearing evaluated, the employee shall not operate loud equipment at work or home including power tools, lawn mowers, etc.

In work locations where either through administrative or engineering controls, noise levels are found to have fallen such that the employee’s 8-hour TWA is below 85 dBA, EH&S shall notify the employee’s Supervisor, by memo, that the employees working in that area are no longer required to be enrolled in the Hearing Conservation Program. The final decision as to an employee’s enrollment status will be left with an audiometric professional at Barnes Care.

The results of area and personnel re-monitoring shall be forwarded to the audiometric professional upon completion of the noise surveys.

Any personnel experiencing difficulty in wearing assigned hearing protection (e.g. irritation of the canals, pain) will be advised to immediately report this to their supervisor and make arrangements to go Barnes Care for evaluation as soon as possible.
The training and education program will provide information about the adverse effects of noise and how to prevent noise-induced hearing loss. At a minimum, all training will cover the following topics:

- Noise-induced hearing loss
- Recognizing hazardous noise
- Symptoms of overexposure to hazardous noise
- Hearing Protection Devises – advantages and limitations
- Selection, fitting, use, and maintenance of HPD’s
- Explanation of noise measurement procedures
- Washington University’s Hearing Conservation Program requirements

University employees shall be encouraged to use hearing protection when they are exposed to hazardous noise during activities at home (e.g. from lawn mowers and chain saws).

All personnel identified for inclusion in the Hearing Conservation Program should receive initial instruction in the requirements of the program.

Supervisors must contact EH&S to schedule training for new personnel assigned to work in noisy environments and for refresher training.