

Environmental Health & Safety Policy Manual		
Issue Date: 1/23/2014		Policy # EHS-400.14
<b>Hearing Conservation Program</b>		

**1.0 PURPOSE:**

To establish policy that defines the minimum requirements for the LSUHSC Hearing Conservation Program and to prevent occupational hearing loss for employees that are exposed to hazardous noise.

**2.0 SCOPE:**

This policy applies to all faculty, staff and students at LSUHSC.

**3.0 RESPONSIBILITIES:**

**3.1 Environmental Health and Safety Department (EH&S) shall:**

- Provide technical and administrative support to assist with implementing the procedures and work practices directed by this policy.
- Initiate exposure monitoring when any information, observation, or calculation indicates that an employee’s exposure to noise may be in excess of 82 dBA, 8-hour TWA.
- Perform baseline noise exposure assessments of any new operation, job, or procedure having the potential of creating a noise hazard.
- Perform monitoring, to include dosimetry, of hazardous or potentially hazardous noise areas or operations.
- Maintain records of exposure assessment results.
- Provide the results of noise surveys and recommendations for control of noise hazards to supervisors.
- Assist in the selection of hearing protective devices and ensure they provide the appropriate attenuation for the noise exposure levels.
- Develop and provide training.

**3.2 Department Heads/Supervisors shall:**

- Report suspected noise hazards to EH&S.
- Coordinate with EH&S to ensure that employees are not exposed to noise hazards in excess of applicable exposure limits.

- Post hazard warning signs on equipment that is known to produce hazardous noise in excess of 85 dBA.
- Post caution signs in rooms that are designated noise hazard areas.
- Implement appropriate engineering and administrative controls as recommended by EH&S as a result of noise hazard/exposure assessments.
- Provide employees with the opportunity to select their hearing protection devices from a variety of suitable hearing protectors.
- Enroll all personnel with noise exposures in excess of the Action Level (82 dBA 8-hr TWA) participate in the LSUHSC Hearing Conservation Program (HCP).
- Ensure each employee participating in the LSUHSC HCP receives applicable training.
- Provide a copy of this policy and other training materials to all employees participating in the HCP.
- Maintain audiometric test records and other pertinent records.

**3.3 Employees shall:**

- Comply with the procedure and training requirements directed by this policy.
- Use established noise control procedures, including the wearing of hearing protective devices where required.
- Notify supervision of areas, operations, or equipment that may be a noise hazard.

**3.4 Designated physician or other licensed health care professional (PLHCP) shall:**

- Provide audiometric testing and work history review to all employees who participate in the HCP.
- Notify employees and employee supervisor's of significant hearing loss or other medical pathology of the ear, and explain the need and plans for further testing and/or referrals.
- Notify both the employee and his/her management if an audiogram identifies that a standard threshold shift has occurred.

**4.0 IMPLEMENTATION REQUIREMENTS:**

**4.1 Personnel Exposure Limits**

- The noise exposure limit at LSUHSC is an eight-hour time weighted average of 85 decibels, A-weighted (dBA 8-hr. TWA). Exposures at or above 100% of this equivalent noise dose are considered hazardous. Refer to Appendix A, Table 1 for the exposure limits.
- Unprotected exposures to continuous noise above 85 dBA are prohibited for any duration.

- Exposure to impact or impulse noise shall not exceed the limits listed in Appendix A, Table 2. Exposures in excess of 130 dB peak sound pressure are prohibited without the use of hearing protection.

#### **4.2 Exposure Monitoring**

- When any information, observation, or calculation indicates that an employee's exposure to noise may be greater than 82 dBA, 8-hour TWA, exposure monitoring will be performed. The monitoring strategy shall be designed to identify employees for inclusion into the HCP and to enable the proper selection of hearing protection. Monitoring shall consist of area, noise dosimetry, and/or octave band analysis monitoring, where applicable.
- Monitoring shall be repeated whenever a change in process, equipment or controls increases noise exposures to the extent that additional employees may be exposed and hearing protection may be rendered inadequate.
- Noise exposure monitoring may be conducted using either a noise dosimeter or a sound-level meter.
- As a minimum, sound-level meters shall meet the Type II requirements of ANSI S1.4-1994 and shall be capable of measuring sound in the range of 80-130 dBA. Measurement shall be in accordance with ANSI S1.13-1995.
- Noise dosimeters shall meet the Class 2A-90/80-5 requirements of ANSI S1.25-1991 and shall be capable of integrating sound levels of 80 decibels (dB) and above. Measurements shall be made in accordance with ANSI S12.19-1996.
- The employee shall be provided the opportunity to observe any noise measurements conducted.
- Any employee exposed at or above the action level (82 dBA, 8-hr TWA) shall be notified in writing within 30 days of the results of noise dosimetry monitoring.
- EH&S shall re-evaluate within 30 days the exposures of persons identified to have experienced a standard threshold shift (STS). This re-evaluation may consist of a review of previous exposure data (either specific to or representative of the employee) or the performance of employee specific noise exposure monitoring. This data shall be provided to the reviewing physician for support in the determination of whether the STS are occupationally related.

#### **4.3 Controls of Noise Hazards**

- Engineering controls shall be the first and primary means of controlling hazardous noise. Where feasible, equipment shall be procured, designed, operated, and/or modified to prevent employee exposure to continuous noise levels at or above 85 dBA or impulsive noise above 130 dBA. Any reductions in noise levels, even if it is not reduced to below exposure limits, are essential.
- Personnel exposures to noise hazards shall be restricted to the minimum number and/or period of time to perform a specific task or function. Where

engineering controls are insufficient in reducing noise levels below the exposure limit, the duration of time spent in the noise hazard area shall be limited; not to equal or exceed the exposure limits in Appendix A, Table 1.

- If engineering and/or administrative controls fail to reduce sound levels to within exposure limits, hearing protection devices (HPD) shall be provided and used. Such devices shall have sufficient attenuation capability to reduce exposures below exposure limits. HPDs shall be worn whenever noise levels exceed 85 dBA.
- If controls fail to reduce sound levels to within the limits of Appendix A, Tables 1 and 2, caution signs that clearly indicate the hazard of high noise and state the requirement to wear hearing protection shall be posted in a readily identifiable location at or near the entrance of the area, room or facility containing the hazardous noise. Decals or placards with similar statements shall be affixed to power tools and machines which produce noise that equals or exceeds 85 dBA at the operator's position. Warning and caution signs shall have wording in black letters on a yellow or orange background.

#### **4.4 Hearing Conservation Program**

- Whenever an LSUHSC employee is occupationally exposed at or above the action level or impact/impulse noise limits in Table 2, the employee shall be enrolled in the HCP.
- For purposes of the HCP participation, employee noise exposures shall be determined without regard to any attenuation provided by the use of hearing protective devices.
- All employees who are enrolled in the HCP shall receive a baseline audiogram and annually thereafter. The baseline audiogram shall be completed within six months of the employee's enrollment into the HCP.
- An exit audiogram shall be provided to employees enrolled in the HCP upon termination of employment, transfer to duties with no hazardous noise exposure, or retirement. An annual audiogram dated within six months may be substituted for an exit audiogram.

#### **4.5 Audiometric Testing Program**

- Audiometric testing shall be made available to all employees who participate in the HCP. The audiogram testing program shall be administered in accordance with OSHA 29 CFR 1910.95.
- Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician; or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometers does not need

to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist, or physician.

- Employees shall be notified in writing that audiograms shall be preceded by a period of at least 14 hours during which there is no known exposure to sound in excess of 82 dBA. Proper hearing protection may be used as a substitute for being noise free.
- A qualified audiologist, otolaryngologist, or physician shall compare the employee's baseline audiogram to the Annual audiogram to determine if the audiogram is valid and if a STS has occurred. When determining if a STS has occurred, allowance may be used for the contribution of aging to the hearing threshold level by adjusting the audiogram.
- If the annual audiogram shows that an employee has suffered a STS, LSUHSC may obtain a retest within 30 days and consider the results of the retest as the annual audiogram. If a retest is not performed, the STS shall become a confirmed STS by default.
- The annual audiogram may be substituted for the baseline audiogram when, in the opinion of the audiologist, otolaryngologist, or examining physician, the hearing threshold shown in the annual audiogram indicates a permanent threshold shift or significant improvement over the baseline audiogram. This audiogram shall be used for comparisons with future annual audiograms.
- When the professional evaluating the audiogram determines that a baseline revision is appropriate, the baseline shall be revised for each ear separately. A baseline audiogram that shows a persistent shift for only one ear may be revised for only that ear. The baseline may not be revised for the other unaffected ear. This procedure is required because it provides a clear indication of how each ear is affected by noise.
- LSUHSC shall provide to the physician performing the audiogram evaluation the following information, as necessary:
  - A copy of the requirements for hearing conservation as set forth in this section.
  - The baseline audiogram and most recent audiogram of the employee to be evaluated.
  - Measurements of background sound pressure levels in the audiometric test room as required.
  - Records of audiometer calibrations required by this section.
- If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift has occurred, the employee shall be informed by their supervisor of this fact in writing, within 21 days of the determination.
- If a permanent STS is determined, the physician will provide an opinion as to if the hearing loss is noise induced (and potentially work related) or whether other medical pathology is suspected.
- The physician shall be provided with noise exposure monitoring data (either representative or employee specific) for employees identified as having experienced an STS and use this data in support of determining if an STS is

potentially work related. The physician shall provide this written opinion to LSUHSC.

- Unless the physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, LSUHSC shall ensure that the following steps are taken when a standard threshold shift occurs:
  - Employees not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.
  - Employees already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
- If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour TWA of 85 decibels indicates that a standard threshold shift is not persistent, the supervisor:
  - Shall inform the employee of the new audiometric interpretation.
  - May discontinue the required use of hearing protectors for that employee.

#### **4.6 Hearing Protection**

- Earmuffs and/or earplugs shall be made available to all employees exposed at or above the action level, and when levels reach or exceed 85 dBA.
- When engineering and/or administrative controls fail to reduce sound levels below the 85 dBA 8-hour TWA, hearing protection devices must reduce exposures to below the exposure limit (85 dBA, 8-hour TWA).
- For those employees who have experienced an STS as identified from an annual medical examination, hearing protectors must attenuate exposure at least to an 8-hour TWA of 82 dBA.
- Employees shall wear HPDs when:
  - Noise levels exceed 85 dBA, independent of duration.
  - Impact/impulse exposure exceeds limits identified in Appendix A, table 2.
- Hearing protectors must attenuate an employee's exposure at least to an 8-hr. TWA of 85 dBA. Hearing protectors shall be evaluated for the specific noise environment in which the protector will be used. The adequacy of attenuation shall be re-evaluated whenever the employee's noise exposure increases to the extent that the hearing protectors provided may no longer provide adequate attenuation.
- The following de-rating criteria shall apply for all types of HPDs, where "NRR" is the manufacturer's Noise Reduction Rating:
  - Required NRR =  $[(L_A - 85) \times 1.67] + 7$ , where  $L_A$  is the measured ambient sound level to which the employee is exposed.
  - HPD attenuation can be approximated quickly using the following formula:
    - Earplugs – Attenuation = (NRR-7)\*.50
    - Earmuffs – Attenuation = (NRR-7)\*.75

- When double hearing protection is used, take the highest attenuation computed for either one (ear muff or ear plug) and add five (5) for the second HPD attenuation, regardless of the formulated value. Example:
  - Earmuff with NRR of 30 and ear plug with NRR of 23 – highest NRR is earmuffs.
  - Earmuff of 30 NRR has attenuation value of  $17 = [(30 - 7) * 0.75]$  and
  - Add attenuation value of 5 as second HPD for the Ear plug
  - Total attenuation is 23 (17+5).
- Hearing protection shall be provided at no cost to the employee. They shall be issued for the exclusive use of each employee and not be traded or shared.
- Employees shall be given the opportunity to select their HPDs from a variety of suitable hearing protectors. Employees shall clean, inspect and maintain all non-disposable and/or earmuff type HPDs.

#### **5.0 EMPLOYEE TRAINING AND EDUCATION:**

- EH&S shall institute a training program for all employees who participate in the HCP. Training shall be repeated annually. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.
- Each employee in the hearing conservation program shall be informed of the following:
  - The effects of noise on hearing.
  - The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care.
  - The purpose of audiometric testing, and an explanation of the test procedures.
- Employee supervisors shall ensure availability to affected employees copies of this policy.

#### **6.0 RECORDKEEPING:**

- EH&S shall maintain an accurate record of all employee exposure measurements required by this section.
- Employee supervisors will retain all employee audiometric test records obtained; the records shall include the following:
  - Name and job classification of employees.
  - Date of the audiogram.
  - The examiner's name.
  - Date of the last acoustic or exhaustive calibration of the audiometer;
  - The employee's most recent noise exposure assessment.
- All records required in the previous paragraphs shall be retained for at least the following periods:
  - Noise exposure measurement records shall be retained indefinitely.

- Audiometric test records shall be retained for the duration of the affected employee's employment plus 30 years.

## **7.0 INSPECTIONS AND PROGRAM REVIEW:**

Program effectiveness will be assessed annually by EH&S.

## **8.0 REFERENCES:**

OSHA 29 CFR 1910.95; Occupational Noise Exposure

## **9.0 DEFINITIONS:**

**Action level** - Continuous noise greater than or equal to a noise dose of 50 percent of the noise exposure limits listed in Appendix A, Table 1, measured with a dosimeter or sound level meter on the A-weighted scale, slow response.

**Administrative control** - Methods of controlling employee's noise exposure by control or manipulations of work schedule, or manner in which work is performed.

**Audiogram** - A record of hearing level measured at several different frequencies.

**Baseline audiogram** - The initial audiogram in which future audiograms are compared with to identify hearing loss.

**Continuous noise** - Variations in noise level involving maxima at intervals of one second or less.

**dBA** - Also known as decibel A-weighting. A unit of sound measurement corrected to the A-weighted scale.

**Decibel (dB)** - A unit of measure to express sound power and sound-pressure level.

**Dosimeter** - An electronic instrument which integrates cumulative noise exposure over time and measures noise dose.

**Engineering control** - Any active (electronic-noise-cancellation technique) or passive (mechanical device or physical barrier) method that reduces the sound level at the source of noise or along the path of propagation of the noise to the individual, not to include hearing protection devices.

**Exposure Limit** - 85 dBA 8-hr Time Weighted Average (TWA), as listed in Appendix A, Table 1.



**Impulsive or impact noise** - Variations of noise levels involving peaks of intensity occurring at intervals of more than one second.

**Noise** - Unwanted or undesired sound.

**Noise dose** - A cumulative measure of noise exposure which takes into account both the intensity of sounds and the duration of exposure to noise during the work shift.

**Noise hazard** - Continuous noise greater than or equal to 85 dBA at the hearing zone.

**Noise hazard area** - Any work area with a continuous noise level of 85 dBA or greater.

**Standard Threshold Shift (STS)** - Audiogram results in which an average threshold shift of 10 dB or more at 2000, 3000, and 4000 Hz in either ear relative to the baseline audiogram.

**Time Weighted Average (TWA)** - The averaging of different exposure levels during an exposure period.

TABLE 1

Noise Exposure Limits Exposure level (dBA)	Hours	Minutes	Seconds
80	25	24	0
81	20	10	0
82	16	0	0
83	12	42	0
84	10	5	0
85	8	0	0
86	6	21	0
87	5	2	0
88	4	0	0
89	3	10	0
90	2	31	0
91	2	0	0
92	1	35	0
93	1	16	0
94	1	0	0
95	0	47	37
96	0	37	48
97	0	30	0
98	0	23	49
99	0	18	59
100	0	15	0

LSUHSC allowable noise exposure limit is the equivalent to an 85 dBA, 8-hour TWA exposure using a 3 dB exchange rate. Table 1 contains noise exposure levels and durations that are equivalent to this limit as calculated by the following formula where *L* stands for exposure level and *T* for duration:

$$T \text{ (min)} = 480/2^{(L-85)/3}$$

**TABLE 2**  
**PERMISSIBLE EXPOSURE LIMITS FOR IMPACT OR IMPULSIVE NOISE**

<u>Sound Level (dB)* or /Permitted Number of Impulses Impacts</u>
<u>Per Day</u>
>130 /None
130 /100
120 /1000
<u>110 /10000</u>

\* Decibels peak sound pressure level