1. Purpose
1.1. The purpose of this procedure is to establish a TVA Hearing Conservation Program (HCP) to prevent employee hearing loss from exposure to high noise levels.

2. Roles and Responsibilities
2.1. Each plant / facility manager shall establish a Hearing Conservation Program at their facility and ensure that the requirements of this procedure are implemented.

2.2. Managers and supervisors implement the HCP by assisting with noise surveys, personal noise monitoring, identifying employees to be included in the program, conducting training, monitoring their employees in the program, (including proper use of hearing protection) and assisting with personal counseling sessions as necessary.

2.3. The TVA Safety Consultant monitors the hearing conservation program at assigned plants / facilities and provides the plant / facility manager with reporting, tracking and support to ensure effective implementation of program requirements.

2.4. TVA Audiologist administers the requirements of the TVA hearing conservation program, maintains audiometric records, evaluates program effectiveness, and provides consultation in the conduct of surveys, monitoring, hearing protection selection and oversight of the audiometric testing performed by TVA personnel and contract providers.

2.5. TVA medical personnel assist with the audiometric testing program, maintain personnel medical data, assist with counseling programs, and review the results of tests with the Audiologist. Audiometric testing may also be performed by contract providers who submit their data to the TVA Audiologist.

2.6. Employees actively participate in the hearing conservation program as set forth in this procedure. Employees shall use hearing protective devices in high noise areas as stipulated in site procedures and in areas identified as “High Noise Areas”.

2.7. All employees shall comply with the requirements of the hearing conservation program. Appropriate disciplinary action shall be taken whenever requirements of the hearing conservation program are violated.

3. Hearing Conservation Program
3.1. TVA shall establish a continuing, effective hearing conservation program whenever Employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures shall be computed without regard to any attenuation provided by the use of personal protective equipment.

3.2. Protection against the effects of noise exposure shall be provided when the sound levels Equal or exceed 85 decibels when measured on the A scale of a standard sound level meter at slow response.

3.3. When employees are subjected to sound equal to or above 85 decibels, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels below 85 decibels, personal protective equipment shall be provided and used to
reduce sound levels to below 85 decibels.

3.4. Exposure to impulse or impact noise should not exceed 140 dB peak sound pressure level.

3.5. All persons who enter an area where the noise level is 85 dBa or greater shall be required to wear approved hearing protection at all times.

4. Noise Exposure Monitoring

4.1. When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, TVA shall develop and implement a monitoring program. Personal monitoring shall be utilized where circumstances such as high worker mobility, significant variations in sound level, or a significant component of noise impulse noise make area monitoring generally inappropriate.

4.2. Noise monitoring shall be used to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.

4.3. Sound level surveys shall be conducted by qualified technicians using properly calibrated equipment to identify all high noise areas. All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels shall be integrated into the noise measurements. Safety shall assist in the accomplishment of these surveys.

4.4. Locations identified as high noise areas shall be identified with signs, "Caution Hearing Protection Required in this Area" or "Caution Hearing Protection Required Beyond This Point".

4.5. A personal noise sampling program shall be established for each site. The program shall include as a minimum:
   • Identifying individuals and work groups to be sampled
   • Establishing a sampling protocol including frequency of monitoring
   • Developing methods for notifying employees of results
   • Developing a program for reviewing results and identifying and implementing corrective actions.

4.6. Monitoring shall be repeated at least every 5 years or whenever a change in production, process, equipment or controls increases noise exposures to the extent that:
   • Additional employees may be exposed at or above the action level; or
   • Attenuation provided by hearing protectors used by employees may be inadequate.

4.7. TVA shall notify each employee exposed at or above an 8-hour time-weighted average of 85 decibels of the results of the monitoring.

4.8. TVA shall provide affected employees or their representatives with an opportunity to observe any noise measurements conducted.

5. Audiometric Testing Program

5.1. TVA shall establish and maintain an audiometric testing program for all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels.

5.2. The program shall be provided at no cost to employees.

5.3. Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngology's, or other physician, or by a technician who is certified by the Council for Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated to the TVA...
Audiologist, 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 performs audiometric testing must be responsible to an audiologist, otolaryngologist, or physician.

5.4. Audiometric tests shall be conducted with audiometers that meet the specifications of, and are maintained and used in accordance with American National Standard Specification for Audiometers, S3.6

5.5. Audiometric tests shall be administered in a room meeting the background noise level requirements as listed in Appendix D of 29 Code of Federal Regulations 1910.95 Occupational Noise Standard.

5.6. Audiometric tests shall be pure tone, air conduction, hearing threshold examinations, with test frequencies including as minimum 500, 1000, 2000, 3000, 4000, and 6000 hertz. Tests at each frequency shall be taken separately for each ear.

6. Baseline Audiogram

6.1. Within 6 months of an employee's first exposure at or above the action level, Human Resources / TVA Medical shall establish a valid baseline audiogram against which subsequent audiograms can be compared.

6.2. "Mobile test van exception." Where mobile test vans are used to meet the audiometric testing obligation, TVA shall obtain a valid baseline audiogram within 1 year of an employee's first exposure at or above the action level. Where baseline audiograms are obtained more than 6 months after the employee's first exposure at or above the action level, employees shall wear hearing protectors for any period exceeding six months after first exposure until the baseline audiogram is obtained.

6.3. Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.

6.4. TVA shall notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the baseline audiometric examination.

7. Annual Audiogram

7.1. Each employee included in the HCP shall receive an audiogram annually after obtaining the baseline audiogram.

7.2. Annual audiograms shall be compared to the employee's baseline audiogram according to protocol established by the TVA Audiologist to determine if a Standard Threshold Shift has occurred. If the annual audiogram shows that the employee has suffered a Standard Threshold Shift, the employee may be retested within 30 days and the results of this test may be considered the annual audiogram. TVA shall notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the retest.

7.3. If a comparison of the annual audiogram to the baseline audiogram indicates a Standard Threshold Shift, the employee shall be notified in writing within 21 days of the determination.
7.4. An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist, otolaryngologist or physician who is evaluating the audiogram:
- The standard threshold shift revealed by the audiogram is persistent; or
- The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

7.5. Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the following steps shall be 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.

7.6. If on-site medical personnel are not present, TVA shall verify that the above steps are performed and documented by either the contract medical provider or other designated personnel.

8. Termination Audiogram

8.1. All employees shall receive an audiogram at termination, retirement, or upon transfer from a location with high noise levels to a work location without high noise levels.

8.2. The termination audiogram must be preceded by at least 16 hours (this is in conformance with the definition of “quiet period” by the Office of Worker’s Compensation Programs OWCP) of no exposure to noise greater than 80 dbA.

9. Audiometer Calibration

9.1. The functional operation of the audiometer shall be checked before each day’s use by testing a person with known, stable hearing thresholds, and by listening to the audiometer’s output to make sure that the output is free from distorted or unwanted sounds. A bioacoustic simulator may be used for performing daily checks as an alternative to human testing. Deviations of 10 decibels or greater require an acoustic calibration.


9.3. An exhaustive calibration shall be performed at least every two years in accordance with the American National Standard Specification for Audiometers, S3.6

10. Engineering and Administrative Controls

10.1. Engineering evaluations shall be conducted as requested to determine feasibility of providing engineering controls to reduce noise exposure. Typical controls to evaluate are:
- Reduce noise at its source (mufflers, sound absorbing materials, enclosures, etc.)
- Interrupting the noise path (using acoustical enclosures, barriers, etc.)
- Selecting new or replacement equipment with lower noise levels
- Reducing reverberation (installing sound adsorbing materials)
- Reducing structure-borne vibration (vibration mounts, proper lubrication, etc.)
10.2. Administrative controls shall be identified and established to reduce noise exposure of

11. Hearing Protection Devices

11.1. TVA shall provide a variety of suitable hearing protectors from which employees may choose. These should be selected from among those approved by the TVA Audiologist and listed on the Master List of Standards.

11.2. Hearing protectors must attenuate employee exposure at least to an 8-hour time-weighted average of 85 decibels or below. In some situations it may be required to use double protection, ear muffs over ear plugs.

11.3. The adequacy of hearing protector attenuation shall be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. TVA shall provide more effective hearing protectors where necessary.

11.4. All personal hearing protection devices shall be kept in a clean and sanitary condition. Each employee is responsible for their equipment.

11.5. Employees required to use ear protection shall be properly trained in the types of protection available, proper use of the devices, and proper storage and sanitation of the devices.

11.6. Employees shall be encouraged to use company provided hearing protection devices off the job where noise exposures can cause hearing loss.

11.7. Employees shall use hearing protection devices as required and as posted at the plants.

12. Training

12.1. All employees who are exposed to noise at or above the 8-hour time weighted average of 85 decibels shall be required to receive annual training ("Hearing Conservation", ATIS 00059129) that informs employees of the following:
   • The effects of noise on hearing; information about hearing protectors,
   • Including the advantages, disadvantages, attenuation, and
   • Instructions on the care, use, and fitting;
   • The purpose of audiometric testing and
   • Information concerning the test procedures.

12.2. Supervisors and managers shall participate in the annual training by discussing TVA’s policy and commitment to the hearing conservation program.

12.3. Additionally, progress reports shall be presented to the employees that includes effective use of ear protection, employee concerns, employee hearing loss results, sampling and monitoring results, and progress on engineering and administrative controls to reduce noise exposure.

12.4. Personal counseling sessions shall be provided if necessary for employees having problems with the proper use of hearing protective devices, as well as those employees experiencing threshold shifts as determined by monitoring audiograms.

12.5. TVA shall make copies of 29 CFR 1910.95, “Occupational Noise Standard” available to affected employees or their representatives through the SRNet or by posting in the workplace.
13. Records

13.1. Records shall be kept of all audiometric testing, personal noise monitoring, or plant area monitoring, and training records.

13.2. Records of audiograms shall include:

- Name and job classification of the employee;
- Date of the audiogram;
- The examiner's name;
- Date of the last acoustic or exhaustive calibration of the audiometer; and
- Employee's most recent noise exposure assessment.

13.3. Records of measurement of background sound pressure levels in audiometric test rooms shall be maintained.

13.4. Audiometric testing records shall be retained permanently, exposure monitoring and training records shall have a minimum retention period of ten years following termination of employment.

13.5. Records kept shall be provided upon written request to employees, former employees, or their authorized (in writing) representative.

14. Definitions

14.1. Action Level - An exposure to an 8-hour time-weighted average of 85 decibels. The action level is the criterion for instituting noise surveys and employee participation in the Hearing Conservation Program.

14.2. Audiogram - A chart, graphs, or tables that result from an audiometric test obtained at least annually to detect shifts in an individual's threshold of hearing by comparison to a baseline audiogram.

14.3. Decibel (dB) - Unit of measurement of sound-pressure level.

14.4. Standard Threshold Shift (STS) - A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. An allowance may be made for the contribution of aging in determining if an STS has occurred. Using OSHA Calculations and application of age corrections to audiograms - 1910.95 App F. A threshold shift can be temporary or permanent. A temporary threshold shift is a change in hearing threshold, primarily due to exposure to high-intensity noise, which is usually recovered in 14 to 72 hours. Any loss that remains after an adequate recovery period is permanent and is termed a persistent threshold shift.

14.5. Sound-level meter (SLM) - An electronic instrument for the measurement of sound levels that conforms to the requirements as specified in ANSI S1.4-1971.
15. Reference


15.2. American National Standard Institute (ANSI) Specification for Audiometers, S3.6

15.3. American National Standard Institute (ANSI) S1.4-1971