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1. Purpose

University of Alaska Anchorage (UAA) employees, student workers, faculty, staff, and outside contractors who work in potentially noisy areas, risk hearing loss. Conservation of hearing is achieved through preventative measures. To reduce occupational hearing loss, all personnel who work in potentially noisy areas, are provided with hearing protection, training and annual hearing tests. This written program is intended to provide UAA personnel with the information they need to protect their hearing while working at UAA.

2. Objective

UAA, in its continuing effort to provide employees with safe, healthful working conditions, and to comply with the Occupational Safety and Health Act is implementing the following program for hearing conservation to protect people working at the University, by helping employees, student workers, faculty, staff, and outside contractors better understand safety and health precautions for tasks involving exposure to noise.

3. Scope

This program applies to UAA employees, student employees, faculty, staff, and outside contractors working on UAA equipment who may be exposed to noise above OSHA thresholds.

4. Definitions

Audiogram - A record of an individual's sensitivity for pure tones in each ear at each of the following frequencies: 500, 1,000, 2,000, 3,000, 4,000 and 6,000 Hz.

Audiometric-Testing - Measurement of a person's ability to hear at several different frequencies, usually 500 to 6,000 Hz

Baseline Audiogram - The audiogram against which future audiograms are compared

dBA - The sound pressure level reading in decibels made on the A-weighted network of a sound level meter at slow response

Decibel (dB) - Unit of measurement of sound level (can be power or pressure depending on the reference level)

Hearing protection - Hearing personal protective equipment (PPE) or hearing protectors are the devices used to prevent noise induced hearing loss. These devices reduce the noise energy entering and causing harm to the inner ear

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

Noise Dosimeter - An instrument that integrates a function of sound pressure over a period in such a manner that it directly indicates a noise dose

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Noise Exposure - The combination of exposure to a single noise level or any combination of noise levels and the duration of exposure

Permissible exposure limit (PEL) - The maximum allowable noise exposure per OSHA. The current PEL for noise is 90 dBA measured over an eight-hour period

Standard Threshold Shift - A change of hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2,000, 3,000, and 4,000 Hz in either ear

Sound Level Meter - An instrument for the measurement of sound level

Time-Weighted-Average Sound Level (TWA) - That sound level, which if constant over an 8-hour exposure, would result in the same noise dose as is measured

5. Authority and Responsibilities

In addition to the roles and responsibilities outlined in the UAA Training Program, the following apply to the Hearing Conservation Program.

EHS/RM

- Work with departments to conduct or facilitate noise surveys to determine the need for hearing conservation
- Assist with the creation and delivery of appropriate training for personnel who are covered by the hearing conservation program
- Assist departments with the procurement of appropriate providers of audiograms when required

Supervisor

- Identify loud areas or equipment, and have noise surveys performed to determine the need for controls or hearing conservation program
- Conduct periodic inspections of noise levels, and PPE use in their department to ensure integrity
- Ensure affected personnel in the department receive baseline and annual audiograms
- Ensure employees provided a choice of hearing protection to be worn, and ensure the hearing protection is being worn

Department Safety Coordinator

- Assist in the determination of areas where noise surveys should be performed
- Conduct periodic inspections of work areas requiring hearing protection to ensure employees are wearing PPE properly

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- Assist in the determination of controls that may be used to reduce noise exposure

Employees/Student Workers

- Participate in the hearing conservation program
- Alerts department supervisor when changes in equipment or operation may require sound surveys

Outside Contractors

- Perform all work in compliance with their company's hearing conservation program, which will be reviewed and approved by the EHS/RM department
- If the company does not have a program, they must comply with this program

6. Hazards Associated with Occupational Noise Exposure

Noise-induced hearing loss can be temporary or permanent. Temporary hearing loss results from short-term exposures to noise, with normal hearing returning after period of rest. Generally, prolonged exposure to high noise levels over a period of time gradually causes permanent damage.

7. Engineering Controls

Engineering controls are design plans or changes to the working environment to prevent or reduce personnel exposure occupational noise exposure. The following example of engineering controls should be considered in area design to reduce the risk of hearing loss.

- Isolate loud equipment with sound-reducing partitions
- Enclose noisy equipment and machinery with sound absorbing materials
- Dampening noise with padding or vibration dampening materials
- Procure alternate equipment which produces less noise
- Perform maintenance on equipment to prevent excessive vibration or friction
- Installation of sound dampening materials on walls and ceilings to reduce noise levels

8. Administrative Controls

Administrative controls are safe work practices and procedures designed to reduce personnel exposure to noise. Examples of administrative controls include the following:

- Posting signs notifying personnel of noisy areas
- Move workers further away from noisy operations
- Schedule noisy tasks for times when fewer personnel will be exposed

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- Limit time personnel can work in noisy areas
- Provide personnel with the proper instruction to properly use equipment and PPE

9. Procedures

When UAA personnel work in areas where noise exposures are equal to or exceed an 8-hour time-weighted average (TWA) sound level of 85 dBA, UAA will research feasible administrative or engineering controls. If such controls are not available or fail to reduce 8-hour TWA exposures to less than 85 dBA, PPE shall be provided and used to reduce the exposure levels to less than 85 dBA TWA, until feasible administrative or engineering controls can be implemented.

UAA will implement this Hearing Conservation Program whenever employee noise exposures equal or exceed the 8-hour TWA sound level of 85 dBA.

UAA will administer the Hearing Conservation Program according to Federal and state regulations. Employees covered by the program must participate in these elements of the Hearing Conservation Program, requiring the following:

- Noise monitoring - When information indicates an employee is exposed to noise levels exceeding the PEL, management will develop and implement a monitoring program. The sampling strategy will be designed to identify employees who need to be included in the program and to enable the proper selection of hearing protectors.
- Audiometric-testing program - UAA will establish and maintain an audiometric testing program. All employees who are covered by the hearing conservation program must undergo audiometric testing.
- Hearing protection - UAA will make hearing protection available at no cost to employees who are covered by the program.
- OSHA requires that hearing protection be worn when the eight-hour TWA meets or exceeds 85 dBA.
- Employees must wear hearing protection whenever noise levels exceed the PEL of 90db.
- Annual training will be instituted for all employees who are exposed to noise levels above the PEL. Supervisors will ensure employee participation in the training.

Noise Signage

All work areas where noise exposures may routinely exceed 85 dBA will be posted with noise warning signs at entrances to these areas. All employees who routinely work in the areas will be included in the hearing conservation program and will wear hearing protection when working in posted areas. All other employees or visitors passing through these areas will be recommended to wear hearing protection.

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Noise Monitoring

A monitoring program will be developed and established for all personnel who are covered by the program. The department supervisor is responsible to procure noise monitoring with assistance from EHS/RM if requested. Noise monitoring responsibilities include:

- Gather valid noise exposure samples by recording noise level readings
- Respond to concerns or complaints of excessive noise in work environments
- Collect and assess noise level reading results
- Recommend to senior management appropriate actions based on noise level reading results
- Coordinate with employees who are candidates for the Hearing Conservation Program.

The monitoring program includes the following:

- Noise monitoring devices worn by employees. This is the preferred method, especially when workers move from one location to another, and when sound levels vary according to location.
- A device positioned to monitor noise within and from a single location performs area monitoring. This is an acceptable method only when personal monitoring is not effective, or when management can prove that area sampling and personal sampling will produce the same results.
- Noise monitoring devices must be calibrated before and after measurements are taken.
- Monitoring will be repeated whenever a change in the work environment increases noise exposure.

Individuals conducting noise-monitoring must send the results of area noise monitoring to the immediate Department Supervisor of the affected employees. The department supervisor must

- Notify employees of personal noise monitoring results. When noise-monitoring results affect an entire work group, all group members must be notified of the results
- Provide EHS/RM with a copy of the results
- Allow employees the opportunity to observe ongoing noise measurements

Noise surveys must be performed at least once every two years in areas where employees are exposed to noise level above the noise threshold.

Noise surveys must be performed when there are significant changes in machinery or production processes that may result in increased noise levels, re-monitoring must be

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conducted to determine whether additional employees need to be included in the hearing conservation program.

Audiometric Testing Program

UAA has established and maintains an audiometric testing program. Testing is provided at no cost to employees covered by the program. A licensed or certified audiologist, otolaryngologist, or other physician must conduct testing. Technicians may conduct audiometric tests if the Counsel of Accreditation in Occupation Hearing Conservation certifies them. The audiometric testing program includes the following components:

Baseline Audiogram

Baseline audiograms establish a basis of comparison for future audiograms. Baseline audiograms must be done within six months of an employee's exposure at or above the PEL.

Pre-Baseline Testing Requirements

To establish an untainted baseline audiogram, employees cannot be exposed to work place noise for at least 14 hours before the test. If a 14-hour buffer is not practical, hearing protection may be used to simulate non-exposure to work place noise. Employees will also be notified to avoid high levels of non-occupational noise exposure in the 14 hours prior to the test.

Annual Audiogram

After the initial baseline audiogram, UAA will obtain annual audiograms for each employee exposed at or above the PEL. The annual and baseline audiograms will be compared to determine the validity of the testing and to see if a standard threshold shift has occurred.

Recordkeeping

Area Noise Monitoring

All non-medical records (i.e. work area and equipment surveys) will be maintained by IUEHS. All personnel who routinely work in designated hazardous noise areas shall be identified and a current roster of such personnel shall be maintained by their departmental management.

Audiometric Testing

Records of all employee audiometric tests shall be retained for the duration of the affected employee's employment. These records will be made part of the employee's health record. These records shall include:

- Name and job classification of the employee
- Date of the audiogram

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- The examiner's name
- Date of last acoustic or exhaustive calibration of the audiometer
- Employee's most recent noise exposure assessment
- Background sound pressure level measurements in audiometric test rooms

All records shall be made available upon written request to the employee or designee at any time without regard to employment status.

Standard Threshold Shift

Standard threshold shift is a change in the hearing threshold relative to the baseline audiogram. If an average shift in either ear of 10 dB or more at 2,000, 3,000, and 4,000 hertz is evident:

- The employee may be re-tested within 30 days. Results of the re-test may be accepted as the annual audiogram.
- An audiologist, otolaryngologist, or physician who will determine if further evaluation is required will assess the audiogram.
- The employee must be informed within 21 days of the determination.
- If it is determined that the standard threshold shift is work related:
 - Employees not using hearing protection must be fitted and trained in the use and care of hearing protection and be required to use it.
 - Employees using hearing protection must be refitted and retrained in the proper use of hearing protection. Hearing protection that affords greater protection may be necessary.
 - Employees may be referred for additional testing after audiograms have been reviewed.

If an employee experiences an STS, that employees' workstation or work area will be specifically evaluated to determine if feasible engineering controls can decrease the noise levels. A checklist to be used is in Appendix A

Types of Hearing Protectors

Hearing protection devices are the first line of defense against noise in environments where engineering controls have not reduced employee exposure to safe levels. Hearing protective devices can prevent significant hearing loss, but only if they are used properly. The most popular hearing protection devices are earplugs, which are inserted into the ear canal to provide a seal against the canal walls. Earmuffs enclose the entire external ears inside rigid cups. The inside of the muff cup is lined with acoustic foam and the perimeter of the cup is fitted with a

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cushion that seals against the head around the ear by the force of the headband.

Mandatory Use of Hearing Protectors

UAA personnel shall properly wear the prescribed hearing protectors while working in or traveling through any section of a location that is designated a High Noise Area (excluding offices, break rooms, and rest facilities). Hearing protectors, either plugs or muffs, will be provided and maintained on-hand by UAA. Hearing protectors and replacements will be provided free of charge, if the originals were not lost or damaged by employee negligence (in which case, the employee will pay for replacements).

In addition to the above requirements, the use of hearing protection will also be mandatory:

- When noise exposure equals or exceeds or is expected to equal or exceed an eight-hour time-weighted average (TWA) of 90 decibels A-weighted (dBA). This noise level is recognized as the permissible exposure limit (PEL) for noise.
- Wherever signs requiring use of hearing protection are posted.
- Whenever determined to be necessary by the UAA.
- Within 20 feet of a machine that displays hearing protection warning labels.

The following additional requirements are also mandatory:

- Employees are required to wear personal hearing protection if they have:
 - Not had a baseline audiogram
 - If they experience a standard threshold shift
- Hearing protectors are provided free of charge to employees
- Hearing protectors must be replaced as necessary
- Employees may choose either earplugs or muffs
- Available noise protection must be reassessed whenever noise exposure increases in the work place
- The UAA will provide more effective hearing protectors if current protection is deemed inadequate
- The evaluation, approval, and acquisition of hearing protective devices are the responsibility of the UAA

Maintenance of Hearing Protection

To maintain hearing protection in proper working condition and prevent injury the following

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should be followed:

- Prefomed earplugs and earmuffs should be washed periodically and stored in a clean area
- Foam inserts should be discarded after each use
- Wash hands before handling pre-formed earplugs and foam inserts to prevent contaminants from being placed in the ear, which may increase your risk of developing inner ear infections
- Earmuffs should be stored in a dry location, and shielded from the elements including ultraviolet sunlight when not in use

10. Inspections

All hearing protection should be inspected prior to each use. For disposable hearing protection examine your earplugs for dirt, damage, deformation or extreme hardness - discard immediately if compromised. For earmuffs examine earcups and ear cushions for cracks and leaks and repair or replace if compromised.

All work areas where noise levels exceed 85 decibels should be inspected regularly to ensure proper signage is maintained and all personnel working in the area are following the procedures in this program.

11. Training

UAA shall provide a training program for each employee falling under the Hearing Conservation Program.

At the time of hire and annually thereafter, all affected employees must attend Hearing Conservation Training. The initial training is conducted as part of the New Hire Orientation Program for newly hired employees (and annual training for affected employees) consists of:

- Rules and procedures.
- Where hearing protection is required.
- How noise affects hearing and hearing loss.
- The permanent or temporary effects of noise.
- The reasons for audiometric testing.
- Audiometric test procedures.
- The need for hearing protection.

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- Selection criteria for hearing protection including:
- Advantages and disadvantages of different styles and models.
- Effectiveness of the different kinds of hearing protectors in reducing noise to the ear.
- How to select, fit, use, and care for hearing protection devices.

All UAA personnel covered by the program must participate in hearing conservation training. Contents of the training must be reviewed annually and documented.

Some employees may experience nuisance noise levels. In these environments, the PEL is never met but noise characteristics and noise duration may be an irritation to employees. Employees who experience nuisance noise levels are not eligible for the program. However, they are encouraged to participate in and audit the hearing conservation training package once a year as long as the noise represents a nuisance. They may select, and wear hearing protectors as prescribed in the training package.

12. Program Evaluation

The Hearing Conservation program shall be evaluated on an annual basis utilizing the protocols set forth by EHS/RM. The evaluation team will consist of a department safety coordinator and a designee from EHS/RM. EHS/RM will define the scope of the evaluation. The final report will be developed by the EHS/RM utilizing the information received during the evaluation. The deficiencies determined in the report will be documented and corrective action plans will be developed.

13. References

OSHA regulation that applies to Hearing Conservation Program is 29 CFR 1910.95.

14. Revision History

Revision Number	Date Revised	Description of Change	Revised By	Approved By
0		Initial Issue		
1				
2				
3				

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Appendix A – Employee Standard Threshold Shift Checklist

The following items must be completed whenever an employee has suffered a confirmed Significant Threshold Shift (STS).

Employee Work Area:

Actions to be completed at the Employee's Work Area	Date Complete and Initials
Re-evaluate adequacy of hearing protection used. Determine what hearing protection the employee uses and determine if it is available and adequate for the conditions in the work area. If ear muffs are used, they should be checked for wear or defects.	
Are there feasible engineering controls that can be implemented to reduce noise exposure in the work area? Contact EHS/RM and Facilities and Campus Services for Assistance. Feasible controls include:	
Do any areas near the employee workstation exceed a noise level of 105 dBA. If so, where?	
Re-train employee in proper use of hearing protection. Note: Hearing protection use is mandatory when exposures exceed 85 dBA.	
Action to be completed by EH&S/RM	Completion Date
Employee notified in writing within 21 days.	
If shift results in ≥ 25 dB average shift at 2,3, & 4 kHz from audiometric zero, record on OSHA 300.	
Has noise monitoring data been conducted that is representative of this employee's job?	
Comments:	