Hearing Conservation Program

1.0 Scope and Application

The following procedures describe procedures for assessing and controlling excessive occupational noise exposure as directed by University policy and State law.

The University shall identify noisy areas on campus and shall take steps to protect personnel who work in these areas. When noise cannot be controlled by engineering and administrative controls, the University shall distribute hearing protectors to all employees exposed to an 8-hour time-weighted average (TWA) noise level of 85 decibels or greater. Under certain conditions, employees shall be required to use hearing protection.

The University shall provide, at no cost to employees involved in this program, a hearing program designed to provide information of satisfactory maintenance of employee hearing levels and to ascertain the effectiveness of noise control methods.

The Hearing Conservation Program affects all employees exposed to an 8-hour time-weighted average (TWA) noise level of 85 dBA or greater. The potential for these noise levels may exist in the following departments and areas:

- Facility Services – Poly Canyon Village
  Plant #1 (cogeneration engines)
- Facility Services - Grounds
- Facility Services - Central Plant
- Facility Services – Engineering Services
- Any Academic Department Shop Facility
- Facility Services- Plumbing Shop
- Facility Services - Electric Shop
- Farm Operations

The only consistently high-noise environment identified on campus is the Poly Canyon Village Plant #1, when the cogeneration engines are in operation. This facility has appropriate signage installed.

All other employees that believe they are working in an environment above 85 dBA TWA should notify the Environmental Health & Safety Office for a noise assessment of the process in question.

2.0 CONTROL OF NOISE EXPOSURE.

The State of California and Federal Government regulate a worker's exposure to noise. The regulations set exposure limits and details the University's responsibilities when the limits are exceeded.

The following is a summary of the safety orders regulating exposure of workers to occupational noise.

2.1 Hearing Conservation Program:

When workers are exposed to an 8-hour time-weighted average (TWA) of 85 decibels (dBA) or greater, the University must institute a hearing conservation program. This program will include monitoring of workplace noise, an audiometric testing program for all exposed workers and an expert evaluation of the test results.

Required audiometric testing must be conducted by a licensed audiologist, otolaryngologist, qualified physician, or trained technician. The results will be made available to employees. Annual audiograms are compared with the baseline audiogram to determine if there has been any deterioration of the worker's hearing (threshold shift). If a worker suffers a significant threshold shift, the University must fit or refit the worker with hearing protectors, train or retrain the employee in their use and make sure they are used.

An audiogram tells us how loud the sound must be, to be heard at different frequencies. It therefore is a measure of hearing loss in decibels. The interpretation of the audiogram results are based on the criteria listed in table below:

Sound level shown on audiogram:	**Meaning of measurement:**
0 db level	The "normal ideal" for the young adult
0 to 25 db level	Within normal limits of hearing
26 to 40 db level	Mild hearing loss
41 to 70 db level	Moderate hearing loss
71 to 90 db level	Severe hearing loss
91 and above db level	Profound hearing loss

2.2 Hearing Protectors:

Workers must wear hearing protectors when:

a. They are exposed to a sound level of 85 dBA or greater and have had a significant threshold shift in hearing.
b. They are exposed to noise in excess of the limits set in Cal/OSHA Title 8, Section 5096, Table N-1; https://www.dir.ca.gov/title8/5096.html

2.3 Training Program:

Workers exposed to noise at or above 85 dBA shall participate in an annual training program. The program will include the effects of noise on hearing, the purpose and effectiveness of hearing protectors, and the purpose of and an explanation of audiometric testing.

2.4 Recordkeeping and Records Access:

The employer will maintain records of exposure measurements for at least 2 years and audiometric tests for the duration of the affected employee's employment.

These records must be made available to workers, former workers, worker representatives, and authorized representatives of the Division of Occupational Safety and Health.

3.0 RESPONSIBILITIES

3.1 Environmental Health and Safety (EH&S) Office:

a. Coordinate the campus Hearing Conservation Program, providing consultation to departments according to their specific needs.

b. Conduct noise surveys in response to department requests or as a general noise survey.

c. Assist departments in developing methods for noise abatement, reduction or control.

d. Coordinate an audiometric testing program for affected employees, providing consultation and notification of exam results. Costs of exams are borne by individual departments.

e. Maintain and make available records of exposure measurements and audiometric tests.

f. Maintain training records

3.2 Departments:

a. Ensure that noise control is considered when procuring equipment, machinery and tools.

b. Identify work areas that may overexpose employees to harmful levels of noise and notify the EH&S Office for exposure assessment.

c. Develop methods for noise abatement, reduction or control.

d. Ensure that any new employee or newly reassigned employee assigned to work in an area with potential for high noise exposure has a baseline audiogram within the first two weeks of employment.

e. Train or arrange training for employees covered by the Hearing Conservation Program; ensure that they read, understand and comply with all appropriate procedures.

f. Purchase and provide appropriate personal protective equipment to affected employees; enforce the use of such devices when required; ensure that such devices are kept in good repair and

maintained in a sanitary manner.

3.3 Employees:

a. Employees are ultimately responsible for the wearing of hearing protection whenever working in noisy environments.

b. Read and comply with all appropriate hearing conservation safety procedures while performing assigned duties.

c. Use common sense and good judgment at all times; the unlimited number of potential hazards that may exist or be created in the work place is sometimes unpredictable.

d. Report unsafe conditions to their supervisor.

4.0 SOUND LEVELS

The following shows some common equivalents of sound levels in decibels (dB):

Exposure to noise with a loudness of 80 dB is annoying. It is roughly equivalent to the noise level of an alarm clock about two feet from your ear.

Exposure to 90 dBA can cause physical damage to the ear.

At about 120 dBA, hearing actually becomes painful and damage to hearing is certain and rapid.

5.0 EFFECTS OF OVEREXPOSURE TO HIGH NOISE ENVIRONMENTS

The ear has three sections. The outer ear helps to direct sound into the auditory canal. The middle ear, separated from the outer ear by the eardrum, consists of three connected bones which transmit the vibrations of the eardrum to the inner ear. In the inner ear a coiled hearing organ, the cochlea, transforms the vibrations into nerve impulses for transmission to the brain along the auditory nerve. The cochlea is lined with cells equipped with tiny hairs and is filled with liquid. As the liquid moves in response to the vibrations of the bones of the middle ear, the hairs move sending nerve impulses to the brain for decoding. The effect of continued overexposure to noise is the destruction of the hair cells and a permanent loss of hearing.

The first warning of hearing loss is often the inability to hear high frequency sounds. People with hearing deficiencies caused by overexposure to noise lose sensitivity to sound at about 4,000 Hz, the approximate frequency of a bird's song or a voice on the telephone. If the overexposure continues, the range will gradually be extended until the entire hearing is affected. As more and more hair cells of the

inner ear are destroyed, the ability to hear is progressively and permanently reduced. Damaged hair cells cannot be repaired or replaced. As a person loses sensitivity to higher frequencies, sounds become distorted. He/she may be able to hear a conversation but unable to understand it. The use a hearing aid makes the sound louder, but it will not clear the distortion.

Overexposure to noise affects the entire body. It is associated with tinnitus (ringing in the ears), increased pulse rate, hypertension, increased secretion of certain hormones, tiredness, nervousness, sleeplessness, and other symptoms of stress.

6.0 NOISE SURVEY

How can you tell there is a noise problem where you work? Common indications of overexposure to noise are temporary hearing loss and muffled speech, ringing in the ears after leaving the work area, or difficulty hearing normal speech in the work area.

If you suspect that there is a noise problem, the next step is to request a noise survey. The purpose of the survey is to measure the noise levels workers are exposed to, find the source of the noise, and determine corrective measures. If a noise survey is needed, the affected employee should inform his/her supervisor who will in turn request this service from the EH&S Office or notify EH&S directly.

7.0 CONTROLLING NOISE

If the noise survey reveals an overexposure problem, the following are alternative ways to reduce the exposure to within acceptable limits.

7.1 Engineering Controls:

Noise levels can be controlled by making changes in the machinery, the way the machinery operates, or the design of the structure in which the machinery is housed. Engineering controls include barriers, damping, isolation, muffling, noise absorption, mechanical isolation, variations in force, pressure or driving speed, combinations of these and other means of reducing noise emissions. The way that these solutions are applied depends on the particular source of the noise and the characteristics of the nose being produced. The practical application of noise controls requires the services of an experienced and innovative engineer.

7.2 Administrative Controls:

These may also be referred to as operational controls. These controls may limit the length of time workers are exposed to noise in the work area. This involves assigning the worker to less noisy areas in the workplace so that the average of his/her daily exposure is less than the permissible exposure limit. The choice of which control to use is governed by the particular noise control problem being encountered.

7.3 Personal Protective Equipment:

When engineering and/or administrative controls either fail to reduce noise to within required limits or

are not technologically feasible, hearing protectors must be used. Depending on your level of exposure, you may choose from the following devices:

- Disposable earplugs
- Reusable earplugs
- Headband plugs
- Sealed earmuffs

All ear protection has a Noise Reduction Rating (NRR) listed on the package of the device. The higher the NRR, the greater the level of noise reduction. Don't automatically assume the product with the highest NRR is the best choice. Over-protection can leave workers with the inability to hear any sound whatsoever and may force them to remove their hearing protection every time they want to speak to a co-worker or hear something in the surrounding environment. Removing your hearing protection in noisy environments for as little as 5 minutes a day can dramatically affect your true NRR. Remember, the best hearing protection is hearing protection that gets worn!

All ear protection should be visually inspected before using. It is important to properly don ear protection to get the NRR protection listed. Protective devices should be both effective and comfortable. Sized ear plugs are made of soft, flexible materials which will conform to the shape of the wearer's ear canal. Other plugs are malleable, made of cotton, paper, plastic, and other materials. They can be thrown away after each use and are designed to fill all ears.

When ear muffs are used, make sure that the seal between the muff and the head is tight. Long hair, glasses, and other obstructions may diminish the effectiveness of the device.