University of Victoria | Occupational Health, Safety & Environment

Noise Control & Hearing Conservation Program

April 2022

Table of Contents

1.0 INTRODUCTION

In compliance with *WorkSafeBC's Occupational Health and Safety Regulation (OHSR) Sections 7.1 to 7.9,* the University of Victoria shall take all precautions reasonable to protect its employees from hazardous noise exposure in the workplace.

The objective of this program is to prevent noise-induced hearing loss caused by exposure to loud and prolonged noise. This will be achieved by identifying all noise hazard areas and all individuals who work in areas where high noise levels exist and implementing the appropriate control measures to prevent noise-induced hearing loss.

The permissible noise exposure limits, according to *Section 7.2 Noise Exposure Limits*, are a time-weighted average of 85 dBA Lex daily noise exposure level and *140 dBC* peak sound level. S*ection 7.3(1)* states that "if a worker is or may be exposed to potentially harmful levels of noise, or if information indicates that a worker may be exposed to a level exceeding 82 dBA Lex, the employer must measure the noise exposure". However, according to *OHSR Section 7.4* an employer is not required to measure the noise exposure of a worker if:

(a) based on other information, the employer identifies the worker as being exposed to noise in excess of an exposure limit, and

(b) the employer establishes an effective noise control and hearing conservation program for that worker.

2.0 SCOPE AND APPLICATION

This program applies to all workplaces at the University of Victoria where sound levels may be equal to or exceed 85 dBA Lex daily noise exposure level or 140 dBC peak sound level and to all employees who work in these areas, or who have the potential to develop noise-induced hearing loss as a result of their occupation. It is the intent of the University of Victoria that, whenever practical or feasible, every effort will be made to reduce or eliminate excessive noise exposure by means of engineering controls. The Program includes provisions for conducting area noise assessment surveys, employee exposure monitoring (i.e., personal noise dosimetry), employee training and education, audiometric testing and evaluation, proper fitting and use of hearing protective devices, and record keeping.

3.0 RESPONSIBILITIES

A. Manager/ Principal Investigator

- Communicate to staff, verbally and through role-modeling that staff health and safety is of primary importance to the University.
- Ensure preventative measures are developed and implemented to minimize or eliminate the risk of occupational exposure to hazardous noise.
- Ensure that workers understand where hazardous noise exists, and that they receive training in safe work procedures and are educated in this Program.
- Ensure that personal protective equipment is readily available and used by staff who are at risk of occupational noise exposure.
- Identify noise hazard areas and employees who may be exposed to noise.
- Maintaining an up-to-date list of noise hazard areas/operations and noise-exposed employees.
- Ensure that all new employees who may be exposed to hazardous noise levels at or above the Regulated levels undergo audiometric testing within the first six months of employment and where practicable, sooner.

B. Employee
- Attend education and training sessions, as required
- Participate in the audiometric testing program
- Properly use and care for hearing protective devices where these devices are required
- Report noise concerns to the Manager/ Principal Investigator and document using the Departmental Incident Investigation Report Form: https://www.uvic.ca/ohse/assets/docs/worksafe/dept.incident.investigation.report.pdf

C. Occupational Health, Safety, and Environment
- Assist departments in the risk assessment process.
- Conduct noise sampling and evaluate the results
- Provide consultation regarding control measures, including engineering controls and the appropriate personal protective equipment.
- Assist in the development of education, training and safe work procedures as well as implementation of this Program.
- Update and annually evaluate this Program based on current Regulations / Standards as well as best practices.

4.0 NOISE MEASURMENT

Monitoring of noisy areas and individual employee exposure to noise levels is a requirement above 82 dBA. Noise sources capable of causing hearing damage can be identified by a noise survey of the area. Once noise sources are identified, exposure of employees working in these areas can be quantified. Sound level monitoring will help to determine if a potential noise exposure issue exists.

Noise exposure measurement must be performed in accordance with the *CSA Standard Z107.56-94 Procedures for the Measurement of Occupational Noise Exposure*. All noise surveys are to be repeated if there is a change in equipment or process which affects the noise level or the duration of noise exposure.

The following information is to be recorded for each assessment:
- Date of measurement
- Work area
- Work or operation performed
- Noise sources in the vicinity of the work station
- Equivalent continuous A-weighted sound pressure level
- Peak or maximum C-weighted sound pressure level (if impact equipment is in use)

a. Monitoring Equipment
All instruments used for measuring noise exposure must meet the requirements of the most recent version of the *ANSI Standard S1.25 -1991 Specification for Personal Noise Dosimeters*.

Sound level measurements can be obtained by using:
1) *A sound level meter:* provides instantaneous sound level measurement of noise emitting from a noise source.
2) *A personal noise dosimeter*: can be worn by the employee to measure the maximum sound level exposure; the equivalent sound level exposure; and the noise exposure pattern of the worker during the entire monitoring period.

According to CSA Standard Z107.56-94, a noise dosimeter is to be set as follows:

Criterion level = 85 dBA,
Threshold level ≤ 80 dBA or at "Off"
Exchange rate = 3

There is an exemption to the noise survey requirement. According to *OHSR Section 7.4 "An employer is not required to measure the noise exposure of a worker if, a) based on other information, the employer identifies the worker as being exposed to noise in excess of an exposure limit"* (e.g., machinery that clearly indicates that exposure levels will be exceeded*), "and b) the employer establishes an effective noise control and hearing conservation program for that worker."*

b. Methods of Noise Monitoring
All sound level measurements should be made at the approximate ear level of the employee.
1) *Area measurement*: using a Type 2 sound level meter (set at A-scale slow response), record the maximum and minimum noise level at the center of each work area. A floor plan can be used for recording noise levels throughout the facility in areas where noise level approaches or exceeds 85 dBA. Noise level measurements are taken and recorded at various locations and distances from the source.
2) *Personal Noise Dosimetry*: tracks individual noise exposure over time. This monitoring is conducted using a noise dosimeter badge worn by the employee throughout their work-shift.

Results of a noise survey will be communicated to the department that required the testing, including Management and Employees.

5.0 NOISE CONTROL MEASURES

A. Engineering Controls
Engineering controls shall be the first noise reduction measure to be considered and may include:
- Substitution with less noisy equipment
- Noise source enclosure
- Acoustical treatment of walls, ceiling and/or floor
- Modifying equipment to reduce noise output

B. Administrative Controls
The following are administrative actions that should be considered:
- Reducing exposure by limiting the time employees work in a noisy area
- Performing noise inducing operations when the least number of workers are present
- Selecting/specifying a lower noise piece of equipment (i.e., substitution) when purchasing equipment
- Ensuring that employees wear their hearing protection

6.0 HEARING PROTECTION

Personal Hearing Protective Devices
Approved personal hearing protection devices shall be available and their use mandatory in areas exceeding 85 decibels over an 8-hour work shift or any peak noise in excess of 140 dBC (instantaneous noise). The table below indicates the class or grade of hearing protector recommended for specific noise levels. It is important that the hearing protector is suitable for the noise level.

Selection of Hearing Protection Devices based upon Grade and Noise Exposure in dBA (from CSA Z94.2-02)

	Recommended		
$L_{ex,8}$(dBA)	**Grade**		**Class**
≤90	1		C
≤95	2		B
≤100	3		A
≤105	4		A
≤110		Dual*	
> 110		Dual + ¥	

Noise Exposure Level ($L_{ex,8}$): noise exposure over an 8-hour period.

* Dual hearing protection is required. Use a minimum of a Grade 2 or Class B earmuff and a Grade 3 or Class A earplug.

¥ Dual hearing protection is required. In addition, it is recommended that exposure durations be limited in this circumstance.

All employees using hearing protection must observe the following precautions:
- Be informed of the proper instructions for the use and limitations of the devices
- Wash hands prior to donning hearing protective devices
- Inspect the integrity of the devices prior to donning
- Replace the device if its ability to function effectively is compromised
- Used hearing protectors that are disposable should be discarded as soon as possible if soiled

7.0 POSTING OF NOISE HAZARD AREAS

Areas where noise exceeds 85 dBA Lex daily noise exposure or 140 dBC instantaneous noise shall be clearly marked as requiring the use of hearing protection.

8.0 EDUCATION AND TRAINING

Educational programs on noise control and hearing conservation shall be conducted by Management or OHSE for new employees requiring training and as requested by departments. Individual sessions on the proper use and care of hearing protection devices can also be conducted on a one-to-one basis (e.g., during audiometric testing).

Educational programs will be provided by Management or OHSE to employee groups identified by the noise survey as having exposure to hazardous noise levels. The education session includes:
- The effect of noise exposure on the loss of hearing sensitivity.
- The precautions to be taken to prevent hearing loss.
- The proper fit, use, and care of hearing protection equipment, to maintain the best operative conditions.
- Regulatory requirements as per the *OHS Regulation 7.1-7.9.*
- A summary of the Hearing Conservation Program and where to access it.
- Description of operations in the work area where there is hazardous noise.

9.0 RECORD KEEPING

Record keeping provides evidence that the program is working and being implemented correctly. All audiometric records are to be treated confidentially and will not be released without the permission of the worker, or as otherwise required by law. The records of training and exposure measurements will also be kept in accordance to *OHSR Section 7.9*.

10.0 OCCUPATIONAL HEALTH SURVEILLANCE

a. Audiometric Testing
Upon receiving results of the noise survey that indicate that exposure results are at or above the Regulated values, the department shall arrange audiometric testing for noise-exposed employees. Audiometry is the best method of determining if hearing loss is being prevented. All audiometric testing shall be performed by a certified audiometric technician using equipment and procedures that are compliant with the WorkSafeBC Regulations.

All departments required to participate in the Hearing Conservation Program shall ensure that all new employees are scheduled for an audiometric test. A baseline audiogram shall be conducted on all employees exposed to noise levels in excess of 85 dBA (over an 8-hour work shift) or 140 dBC within six months of commencement of employment in the noisy area, or earlier if practicable.

It is the responsibility of the department to organize audiometric tests for their noise-exposed employees. The test is confirmed with an Appointment Letter to the employee (see attached letter).

The Employer must inform affected workers of the results of any noise exposure measurement and the significance of the measurement to the risk of hearing loss (Section 7.3(4)). Counseling regarding the results of the audiogram is conducted by the contracted service technician at the time of the audiogram. The Employer must ensure that authorized testers send the test results to the Board in accordance with *OHSR Section 7.8 (3).*

b. Frequency of Testing
A test must be performed every 12 months after the initial test for the duration of exposure in the noise-exposed area, in accordance to *OHSR Section 7.8 (1)(b).*

c. Selection of Employees
It is the responsibly of the Manager/ Principal Investigator to insure that all employees receive audiometric testing where:

- Employees whose 8-hour time-weighted average noise exposure equals or exceeds 85 dBA
- Employees being hired or moved into jobs where noise exposure is known to exceed 85 dBA or 140 dBC
- New hires who may be exposed to hazardous noise levels

11.0 ANNUAL PROGRAM REVIEW

This program will be reviewed at intervals that reduce the possibility of hazardous noise exposure and updated annually as required by S*ection 7.5 (g) of the Occupational Health and Safety Regulation (OHSR)*.

(Insert Department here)

NOTICE

APPOINTMENT LETTER FOR AUDIOMETRIC TESTING

To: _____

Department: _____

As part of the UVic OHSE Noise Control and Hearing Conservation Program, a hearing test has been scheduled for you on:

Date: _____

Time: _____

(Insert Location of audiometric test).

Note the following:

- Please be advised that your participation in this program is required by WorkSafeBC.
- Please bring your protection (earmuffs or plugs) with you to the appointment.
- Please be on time. The test will take approximately thirty minutes.
- This program is designed to measure your hearing and determine if there has been any hearing loss beyond the level of natural decline (i.e., presbycusis).

If you have any questions, please direct them to your Manager/ Principal Investigator.

If you are unable to keep this appointment, please contact (Insert Contact person and info) **immediately** to make another appointment.

Introduction

This supplement is to be used in conjunction with the existing University of Victoria Noise Control and Hearing Conservation Program that is under the administration of Occupational Health, Safety, and Environment (OHSE). This supplement provides additional instruction to (Insert Department here) employees with regard to noise exposure and hearing conservation.

Assessment

Noise level monitoring has been completed by OHSE at various locations throughout the facility.

Survey results are to be maintained by OHSE and copies are to be submitted to the Department. If a new high noise hazard area or task is identified, the affected individual must contact the Manager/ Principal Investigator, who will request a noise measurement from OHSE.

If an area is shown to have noise levels exceeding 85 dBA Lex daily noise exposure, or 140 dBC peak sound level, the area must be identified as a noise hazard area with signage in accordance with *Section 7.5 (e) of the OHSR.*

Previous noise assessment results are summarized in Table 1.

Noise Control Measures

Engineering Controls

After it has been determined that noise levels are above 85 dBA or 140 dBC, engineering controls must be evaluated and implemented (where practicable) to reduce the noise exposure levels. Where there is a need to reduce noise levels, the following options should be considered, where feasible, prior to reliance on hearing protection:

Substitution with less noisy equipment;
Modification of the process or equipment;
Enclosure of the noise source;
Isolation of the worker from the noise source;
Acoustical design and treatment of the work area.

The impact of increased noise in the workplace shall be considered whenever new equipment is purchased. This shall apply to the procurement of either additional or replacement equipment.

Identification of Noise Hazard Areas

If it is not practicable to reduce noise levels to below the exposure limits (i.e., 85 dBA daily lex exposure or 140 dBC peak sound level), warning signs shall be posted on access points to the work areas and within the work areas.

Hearing Protection Devices

Where engineering controls are impracticable, workers entering into posted noise hazard areas must wear hearing protection when:

Noisy equipment/machinery is in operation (e.g., shop areas)
They will be remaining in the noisy area for extended periods of time (greater than 5 minutes).

If uncertain as to whether or not hearing protection is required, an assessment of the area or activity should be conducted in accordance with Section 2.0 of the Noise Control and Hearing Conservation Program.

All hearing protection devices must meet the requirements of *CSA Standard Z94.2-94, Hearing Protectors*.

The (Insert site and Department here) department will maintain various styles of foam ear plugs and ear muffs for use by Employees.

All ear plugs and ear muffs must have a sufficient a Noise Reduction Rating (NRR) to reduce noise levels to below recommended exposure limits. As a minimum, all hearing protection devices should have a NRR of 25.

Hearing protection devices appropriate for the task at hand, shall be selected in accordance with the selection criteria as presented in Section 5(c) of the Noise Control and Hearing Conservation Program.

Tasks Requiring Hearing Protection

(Insert Department here) employees perform a variety of tasks which may require the use of hearing protection. These tasks may include, but are not be limited to:

Drilling
Cutting/Sawing
Grinding
Landscaping activities (e.g., lawn mowing, leaf blowing)
Working with noisy equipment/tools

Audiometric Testing

Hearing tests are administered by a contracted audiometric testing company.

A baseline audiogram will be completed on all (Insert Department here) employees with the potential exposure level at or above the *OHSR Regulations*. Those employees exposed to noise levels in excess of 85 dBA (over an 8 hour work-shift) or 140 dBC, within 6 months of commencement of employment. Audiometric testing will be completed every 12 months after the initial baseline test.

A worker shall receive additional periodic follow-up hearing tests in any of the following circumstances:

- Where a worker has been exposed to an unusually loud noise,
- Where an ear infection, head injury, or complaint related to the ear has occurred
- Where an audiogram has been classified as an “abnormal change” in hearing levels

The (Insert Department Here) will advise when additional follow-up hearing tests are required.

Booking and Recording Procedure

(Insert Department Here) staff members are notified via an internal memo every (insert month) that they are due for their annual hearing tests and their upcoming appointment date.

Each employee will attend their audiometric testing on the designated date and time for their hearing test.

If the employee cannot attend the arranged appointment, they **must** contact their Manager/ Principal Investigator to cancel and re-book for another date and time.

Records

The storage of records by the (Insert Department Here) must be kept current for all audiometric testing that has been completed, and it must indicate any workers who have not received a test or are due for a test.

Program Review

The Occupational Health Safety and Environment Department, in conjunction with (Insert Department Here) Management must conduct an annual review of the Noise Control and Hearing Conservation Program supplement and practices.

The review must consider the following:
- the need for further noise measurement;
- the education and training of workers regarding noise exposure;
- the adequacy of noise control measures;
- the selection and use of hearing protection; and
- audiometric testing and information on the rate and extent of occupational hearing loss.

Forms

HC-01 Appointment Letter for Audiometric Testing

Table 1 – Noise Exposure Level Monitoring

Date:	Building Location / Area	Operations / Noise Source	Sound Pressure Level (dBA/ dBC)