

	HEARING CONSERVATION PROGRAM ALL-HSE-PGM-144	Retention Code: CG01-CA
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1.0 Purpose

This Program applies to all CPC employees who may be exposed to noise levels in excess of 82 dBA L_{ex} .

It identifies how to protect personnel from exposure to occupational noise levels that may increase the risk of hearing loss.

This Program is designed to meet or exceed the requirements of Canadian Provincial and Territorial OHS legislation, as well as OSHA (U.S. Occupational Health & Safety Administration). Refer to Appendix A for further details.

2.0 Hazards to Mitigate

- Temporary hearing loss or temporary threshold shifts
- Ruptured eardrums
- Increased stress levels and fatigue
- Increased blood pressure and heart rate
- Speech impairment
- Permanent hearing loss

3.0 Roles and Responsibilities

3.1. Management

- Ensure the Hearing Conservation Program (HCP) and all its components are implemented, administered and enforced.
- Review annual results of the HCP and audit the program and implement corrective actions where necessary
- Work with Occupational Health to address any abnormal hearing loss trends, or program deficiencies.
- Provide the necessary resources for the application of this Program.

3.2. Supervisors

- Review and update the list of employees requiring testing described including information related to employees department, supervisor, and location within a month of receiving the list from Occupational Health.
- Maintain an up-to-date map of noise hazard areas/operations and a list of noise exposed workers.
- Ensure hazard warning signs are posted outside entrances to noise hazard areas.
- Ensure baseline audiometric testing is conducted for any new employees who may be considered as a noise exposed employee, within the first six months of employment or exposure.
- Ensure all potentially exposed workers are provided with appropriate noise controls including hearing protection.

- Ensure employees complete required training sessions on noise hazards, noise induced hearing loss and the HCP.
- Arrange for all noise exposed employees to have the required hearing testing completed when the audiometric provider is on site. If they are not tested, advise Occupational Health which employees were missed so that testing can be arranged.

3.3. Employees

- Participate in audiometric testing every 2 years, if identified as a noise exposed employee.
- Wear hearing protection devices in accordance with training provided.
- Report noise hazards and hearing protection problems to the appropriate supervisor.
- Maintain hearing protection in sanitary condition and proper working order.
- Participate in personal noise dosimetry testing, as requested, as part of the Industrial Hygiene and Medical Surveillance programs.

3.4. Contractors

- Comply with regulatory requirements and follow this Program or the contractor's equivalent program when working on CPC property, leases, and/or right-of-ways.
- Adhere to the contractor's hearing conservation program for audiometric testing and to CPC's Specification regarding the use of personal protective equipment (PPE), unless the contractor's program is more stringent.
- Provide documentation to CPC supervisor of the contractor's training before work begins, where requested.

3.5. Occupational Health Nurse

- Provide Management with a list of noise exposed employees requiring audiometric exams, sorted by location, department, and supervisor.
- Update the enrollment list based on supervisors recommendations.
- Arrange and perform audiometric testing on all noise exposed employees.
- Advise employees of test results at time of testing and educate employee as to hazards of noise-induced hearing loss (NIHL).
- If any employees are identified as having a standard threshold shift (STS) or abnormal shift/change, arrange for a retest audiometric exam to confirm results.
- If results of retest confirm shift, refer to Occupational Health Physician and engage the Determination Panel if required to determine whether noise loss is work-related.
- Follow through on Occupational Health Physician's recommendations (referrals).
- Maintain records of audiometric testing results, documentation of referrals and reports in accordance with jurisdictional privacy laws.

3.6. Occupational Health Physician

- Contact employees who have been identified as having a STS, complete Work Relatedness Determination form (Appendix B), and advise OHN and Determination Panel where required to determine if hearing loss is work-related.
- Counsel on hearing loss prevention.
- Refer to family doctor for clinical audiological evaluation or otolaryngologist examination, as appropriate.
- Advise management, at year end, as to the effectiveness of the Hearing Conservation Program.

3.7. Industrial Hygienist

- Coordinate exposure assessments of workers.
- Identify similar exposure groups (SEGs) and provide guidance to Management and Supervisors on SEGs and requirements for their inclusion in the Medical Surveillance Program and audiometric exams.
- Coordinate noise exposure and survey assessments to verify if engineering and/or administrative controls are effective, or if required, how they will be implemented.
- Identify areas or processes requiring noise attenuation and/or signage.
- Recommend feasible and practical noise control options.
- Periodically re-evaluate employee exposure through the review of job profiles and associated processes, equipment, tools and work tasks. Where changes are identified, determine which job profiles need to be classified as noise exposed employees for the purpose of audiometric testing and inclusion in the HCP.
- Provide technical services and advice regarding control measures.
- Assist workers in the selection of appropriate hearing protection devices on request.
- Assist with the development and implementation of appropriate HCP training and education.
- Review, evaluate and maintain the HCP on an annual basis.

3.8. HSE Operations Specialists

- Support the implementation of the Hearing Conservation Program by working with Operations to ensure workers requiring audiometric testing are identified and testing is completed as required.
- Work with Industrial Hygienist on selection of hearing protection where required.

4.0 Program Elements

4.1. Overview

- Where noise may be a problem, noise exposure levels must be assessed.
- Exposure to noise must not exceed Occupational Exposure Limits (Appendix B)
- Where employees are not exposed to noise levels of 82 dBA L_{ex} or above, levels should be checked periodically to ensure they are still at safe levels.

- Where feasible, workplace noise levels shall be minimized by engineering controls at the source, and/or administrative controls.
- After implementation of controls, if noise levels still exceed the exposure limits, employees are required to wear Class A hearing protection devices and may select those that comfortably fit them.
- The use of hearing protection is mandatory in posted or otherwise identified noise hazard areas.
- Dual Hearing Protection must be worn in areas where noise exceeds 100 dBA.
- Warning signs must be posted in any work area where the noise level exceeds 82 dBA.

4.2. Hazard Identification, Assessment and Control

4.2.1. Noise Surveys

Noise surveys must be developed for all CPC locations where employees may be exposed to noise levels equal to or greater than 82 dBA, except in Saskatchewan where a noise survey must be conducted where employees may be exposed to 80 dBA.

Noise assessments must be conducted by a competent person who has been trained in the use of the sound measurement equipment. All equipment must meet the minimum standards as outlined in ANSI Standards (see references below) and CSA Standard Z107.56-06 *Procedures for Measurement of Occupational Noise Exposure* (see references below).

Testing equipment may include:

- Sound Level Meter (ANSI Standard S1.4-1983)
- Noise Dosimeter (ANSI Standard S1.25-1991)
- Integrating Sound Level Meter (ANSI Standard S1.43-1997)
- Other equipment, acceptable based on legislation in province assessment is conducted.

4.2.1.1. Survey Updates

Noise surveys must be updated when:

- Workers notice a significant increase or decrease in noise
- The Management of Change Process indicates noise levels have changed significantly due to:
 - Addition or removal of noise producing equipment to a site or area.
 - Changes in operational processes such as, but not limited to:
 - Compressor cylindering
 - Driver change outs
 - Noise suppression systems modifications
 - Additions or depletions of turbo expanders (cryogenics)
 - Aerial coolers - modifications, additions or reductions
 - Addition of gas piping recycle loops
 - High pressure differential controllers

- Modifications of buildings where potential for increased noise exposure outside of the building
- Installation of turbines

A repeat noise survey is not required in the event a facility is able to verify and document no significant change in noise level has occurred. This must be confirmed through the use of a calibrated noise meter.

4.2.2. Hazard Controls

The following hierarchy of noise control methods should be used when mitigating noise exposures.

Engineering	Administrative	Personal Protective Equipment
<ul style="list-style-type: none"> • Specifications for low noise equipment on equipment purchases. • Substitution by machines with lower noise emissions. • The use of acoustical baffles or choice of quieter equipment (at Source). • Use of sound barriers. • Use of booth to enclose worker. • Use of absorbing wall panels (acoustical treatment of room). • Increasing distance between worker and noise. • Combination of any of the above. 	<ul style="list-style-type: none"> • Reduce time of exposure through breaks, rotation of work tasks/schedules. • Warning signs must be posted in all areas where noise levels exceed 82 dBA, Note: In Saskatchewan warning signs must be posted in areas exceeding 80 dBA. • Warning signs must be installed next to all entrances on buildings. They must not be covered when doors are open. • Noise maps must be available to identify where noise levels exceed 82 dBA (or 80 dBA in Sask). The maps must extend beyond the fixed structure and be communicated to workers at the site. Note: CPC does not post warning signs on the periphery of the work area. Noise maps must be used to ensure all workers wear appropriate HPD at the perimeter of the regulated noise level. • Signage may be used for high noise mobile equipment and other temporary operations. • Training and education must be completed as per CPC’s training matrix. 	<ul style="list-style-type: none"> • Hearing protection must be worn in all areas exceeding 82 dBA. • Only Class A (NRR rating of 24+) is permitted • Double protection (ear plugs and ear muffs) must be worn in areas in excess of 100 dBA. • Note: in Saskatchewan single hearing protection must be made available to workers exposed to noise levels starting at 80 dBA, but wearing is optional. Hearing protection is mandatory when levels exceed 82 dBA.

4.3. Audiometric Testing

Audiometric testing and processes must meet the requirements of the Audiometric Testing and Process Procedure.

Testing is to be conducted within six months of an employee’s first exposure to occupational noise to establish a baseline. An additional audiogram must be performed not longer than 12 months after the initial baseline test, and every second year.

- Employees will be sent an email to request them to book an exam on their own if they miss the testing dates scheduled for their area.
- A second email, copying the employee’s supervisors, will be sent as a final notification of missed exams, if the employee has yet to arrange testing after the first email.
- Employees who fail to complete the testing in the allotted testing time will be restricted from field work until they complete the necessary testing.

4.4. Hearing Loss Assessments

As per the Audiometric Testing Procedure, where audiometric assessments identify a standard threshold shift (STS) or an abnormal shift (AbS), follow up testing must be completed.

Upon confirmation of an STS or an AbS that is initially deemed as work related by the physician, CPC’s Hearing Loss Determination Panel will be convened to assess the work relatedness and recordability.

Table 2: CPC Hearing Loss Determination Panel

Occupational Health	HSE Operations	Business Unit
<ul style="list-style-type: none"> • Manager Health Services • Occupational Health Nurse • Regional Occupational Health Manager (corporate) 	<ul style="list-style-type: none"> • Manager, Technical Services • HSE Manager for affected business unit • Industrial Hygienist 	<ul style="list-style-type: none"> • Manager for affected business unit • Ops Supervisor or equivalent • Immediate Supervisor of affected worker

4.5. Results

Records of audiometric testing, noise survey measurements and worker education and training must be retained.

Records of noise surveys or personal dosimetry results must contain:

- Date of measurement.
- Time of day and weather conditions.
- Workers or occupations evaluated, if applicable.
- Measuring equipment used, including model and serial number.
- Calibration information.
- Sound level readings measured, in dBA, and response scale (slow).
- Work locations evaluated.
- Type of hearing protection used by the worker, if any, for personal dosimetry.

5.0 Program Review and Evaluation

This Program is to be reviewed and evaluated annually. The annual evaluation must include:

- Effectiveness of the education and training.
- Need for further noise measurement.
- Adequacy of noise control measures.

Note: In B.C., the Joint Health and Safety Committee (if available) must review and approve the HCP.

6.0 References

- Alberta Occupational Health and Safety Code, Part 16
- British Columbia Occupational Health and Safety Regulations, Part 7, Division 1
- Saskatchewan Occupational Health and Safety Regulations, Part VIII
- NWT General Safety Regulations
- CSA Standard Z107.56-06, Procedures for the Measurement of Occupational Noise Exposure
- CSA Standard Z94.2-02 (R2007), Hearing Protection Devices - Performance, Selection, Care, and Use
- WorkSafe BC – Hearing Loss Prevention-Explanation of Industrial Audiogram (Hearing Test) Categories
- SK Labour Relations and Workplace Safety – Audiometric Testing in Saskatchewan
- CPC Industrial Hygiene Program (ALL-HSE-PGM-155)

7.0 Document Retention

Records must be retained in accordance with ConocoPhillips’ Document Retention Schedule.

Record	Owner	Classification	Retention
Employee noise assessments (dosimetry)	Industrial Hygienist	HE05 – CA	Termination of Employment +30 years
Noise evaluations	Industrial Hygienist	HE06 – CA	Permanent
Results of audiometric tests	Occupational Health Nurse	HE05 – CA	Termination of Employment +30 years
Injury/Illness Report	HSE Performance Assurance	HE03	Permanent

Appendix A – Definitions

Abnormal Shift (Abs)	A shift in either ear of 15 dB at two consecutive frequencies from 1000 Hz to and including 6000 Hz when compared to the baseline test.
Baseline Audiogram	A valid audiogram against which subsequent audiograms are compared to determine if hearing thresholds have changed.
Controls – Administrative	Efforts, usually by management, to limit workers’ noise exposure by modifying workers’ schedule or location, or by modifying the operating schedule.
Controls – Engineering	Any use of engineering methods to reduce or control the sound level or a noise source (isolation, maintenance, modification or substitution).
Decibel (dB)	The unit used to express the intensity of sound.
dBA:	An instantaneous occupational noise level that is measured based on an ‘A’ weighted scale to account for the anatomy of the human ear. This is not be the noise level the worker is exposed to over their entire shift unless they spend the whole shift at that noise level. Average noise exposure over a shift is calculated using dBA Lex.
dBA Lex	The level of a worker’s total exposure to noise in dBA, averaged over the entire workday and adjusted to an equivalent 8 hour exposure (e.g. a worker who works in an average of 85 dBA of noise for 16 hours has an Lex of 88 dBA, and for four hours an Lex of 82 dBA).
Dosimeter	Dosimeter:
Hazardous Noise	Any sound for which any combination of frequency, intensity, or duration is capable of causing permanent hearing loss in a specified population.
Hearing Protection Device (HPD)	HPD (Hearing Protection Device): Personal protective equipment used to reduce (attenuate) noise exposure. Common HPDs are earplugs and earmuffs. All HPDs are rated as to their attenuation capability using CSA Class A, B, or C, or the NRR (noise rating reduction) system.
Isolation	An Engineering Control method – Isolating workers with the use of sound barriers, partitions, enclosing the equipment and/or using sound absorbent material.
Lex	An Lex measurement averages a worker’s total exposure to noise over the entire workday and adjusts it to an equivalent 8-hour exposure. 85 dBA Lex is equivalent to an exposure of 85 dBA for an 8 hour shift, time weighted average (TWA), or 82 dBA over 16 hours or 88 dBA over 4 hours (see Appendix B).
Maintenance	An Engineering Control method – Repairing malfunctioning or poorly maintained equipment.
Noise-Exposed Employee	An employee who is or may be exposed to noise in excess of 82 dBA Lex during one or more shifts annually
Noise Hazard Area	A work area that is identified as requiring mandatory hearing protection; where the measured noise levels exceed 82 dBA.
Noise Induced Hearing Loss (NIHL)	A hearing loss that is attributed to noise.
Noise reduction Rating (NRR)	The number rating which attempts to describe the level of protection obtained with proper use of the hearing protection device (plugs or muffs).
Standard Threshold Shift (STS)	Average 10 dB age-adjusted shift across 2000, 3000 and 4000 Hz in either ear from the most recent STS baseline.
Substitution	An Engineering Control method – Replacement of noisy equipment, machinery or processes with quieter ones.
Threshold	Level at which effect starts, the level that must be reached for a psychological or physiological effect to begin or be noticed.
Tinnitus	Ringling in the ears that can be an early indicator of hearing loss.

Appendix B – Occupational Exposure Limits for Noise

Exposure Level (dBA)	CPC Allowable Exposure Duration
82	16 hours
83	12 hours and 41 minutes
84	10 hours and 41 minutes
85	8 hours
88	4 hours
91	2 hours
94	1 hour
97	30 minutes
100	15 minutes

Appendix C – Revision Record

Page#	February 8, 2016	Previous Information	Risk Assessment
3.3, 4.3	If an employee has been identified as a noise exposed employee, participation in audiometric testing frequency has changed from annually to every 2 years.	Annual retesting.	Low – change is in line with OHS minimum Legislative requirements
Page#	November 14, 2014	Previous Information	Risk Assessment
All	The entire program has been re-written to reflect transition audiometric component to Occupational Health.	N/A	Low – clarification of requirements and expectations
2-4	Roles and responsibilities updated for Operations Management, Occupational Health Nurse, Industrial Hygienist and employees	Less detailed	Low – clarification of requirements and expectations
2-4	Roles and responsibilities <u>added</u> for Supervisors, contractors, Occupational Health Physician and HSE Operations Specialists	None	Low – clarification of requirements and expectations
6	Engineering and Administrative Controls and PPE information reformatted into a table.	Same as previous versions	Low – clarification of requirements and expectations
7	Audiometric testing section has been updated to refer to the Audiometric Testing and Process Procedure maintained by Occupational Health.	More details on who can conduct assessments that have been removed and included in the Audiometric Testing and Process Procedure.	Low – new expectations documented in Audiometric Testing and Process Procedure.
7	Section 4.4 Hearing Loss Assessments and reference to the CPC Determination Panel added.		Med – Reduces instances of non-compliance. Sets out expectations for reviewing STS and determining recordability for TRR purposes.
Page#	November 4, 2013	Previous Information	Risk Assessment

<p>7</p>	<p>Noise surveys must be repeated:</p> <ul style="list-style-type: none"> • When workers notice a significant increase or decrease in noise • When the Management of Change Process indicates noise levels have changed significantly due to: <ul style="list-style-type: none"> - Addition or removal of noise producing equipment to a site or area. - Changes in operational processes such as, but not limited to: <ul style="list-style-type: none"> - Compressor cylindering - Etc. 	<p>9. Noise Surveys</p> <p>Noise surveys must be repeated at intervals of no greater than 5 years, and whenever the facility undergoes changes that could alter the noise levels significantly.</p>	<p>Medium - Change was requested by operations to remove the 5 year repeat interval for noise surveys and this is supported by HSE leadership.</p> <p>The repeat interval required by the Alberta OHS code will now be determined by operations using the MOC process.</p> <p>This change has been approved by the WCBU and Oil Sands MOC coordinators.</p> <p>Risk of change will managed with the effective use of the MOC program to identify changes requiring sound map updates.</p>
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Page#	November 4, 2013	Previous Information	Risk Assessment
8	<p>Note 2: In operational areas where hearing protection signs are only posted on fixed structures and where the regulated noise level extend beyond the fixed structure, facility noise maps must be used to ensure all workers wear appropriate hearing protection at the perimeter of the regulated noise level.</p>	None	<p>Change was requested in response to audit findings to clarify CPC expectations and to align with current practice of posting signs only on buildings.</p> <p>Operations will need to make workers aware of the location of noise maps and train them in their use. There will also need to be a process to communicate updated noise maps according to the MOC process.</p>