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Hearing Protection Standard

1.0 PURPOSE

This standard supports the Hazard Controls Policy and specifies the requirements for the selection, use, inspection and care of hearing protection in SaskPower workplaces to prevent injury.

2.0 DEFINITIONS

2.1 Decibel (dB)

A logarithmic measurement of sound pressure.

2.2 Decibel A Scale (dBA)

The sound pressure level in decibels measured on the A scale of a sound level meter. When the A-weighting scale is selected, the meter will mimic the way the human ear responds to sound.

2.3 Equivalent A-weighted Sound Level (L_{eq})

L_{eq} is the equivalent steady sound level of a noise energy-averaged over time. It is the energy actually measured by a sound level meter or noise dosimeter on the dBA scale.

2.4 Hearing Conservation Plan

A written plan that includes identification and assessment of noise exposure hazards in the workplace, the provision of appropriate controls, monitoring employee exposures and regular review.

2.5 Hearing Protection Device (HPD)

A personal device also referred to as a hearing protector, worn as a barrier to reduce the sound level entering the ear in order to diminish the harmful auditory and/or annoying subjective effects of sound.

Hearing protection devices are not approved by the Canadian Standards Association instead manufacturers rate the noise attenuation of their device(s) in a laboratory setting using ANSI Method S3.19-1974 in accordance with US Environmental Protection Agency (EPA) regulations.

2.6 Earmuff

A hearing protector usually consisting of a headband and ear cups with a soft outer ring or cushion intended to fit snugly against the sides of the head.

2.7 Earplug

A hearing protector worn within the external ear canal (an insert or aural earplug) or against the entrance to the external ear canal (a semi-insert or semi-aural earplug).

2.8 Noise

Unwanted sound that causes harm or that interferes with communication.

2.9 Noise Exposure

Exposure to any unwanted sound. Overexposure is considered to be > 85 dBA $L_{ex, 8}$ by OH & S.

2.10 Noise Exposure Level ($L_{ex, 8h}$)

L_{ex} is the noise exposure level.

$L_{ex, 8h}$ is the sound level energy-averaged over 8 hours expressed in dBA, which would give the same daily noise exposure dose as the varying noise over a typical full shift.

2.11 Noise Reduction Rating (NRR)

A single number representing the reduction of sound pressure (attenuation) a HPD provides under controlled laboratory conditions when measured in accordance with ANSI Method S3.19-1974. The higher the NRR value, the greater the average reduction of sound pressure across the range of human speech frequencies.

3.0 METHOD / PRACTICE

3.1 Identify Noise Exposure

All tasks, assignments and circumstances where noise exposure hazards exist shall be identified via documented Hazard and Aspect Risk Assessment (**HARA).**

A noise survey shall be conducted by a competent person in workplaces where noise levels may exceed 80 dBA to determine if a noise exposure hazard exists.

Noise levels shall be re-measured where:

- Altering, renovating or repairing the place of employment,
- Introducing new equipment that may result in a significant change in noise levels or occupational noise exposure, or
- Modifying any process at the place of employment may result in a significant change in noise levels or occupational noise exposure.

3.2 Noise Control Methods

Whenever practicable eliminate the source of hazardous noise. When elimination is not possible, then substitution of noisy equipment by quieter equipment should be considered to protect workers from hazardous noise.

If the hazardous noise cannot be controlled through elimination of the source or substitution of quieter equipment, engineering controls may be installed to reduce noise to safer levels. Engineering controls require physical changes to the workplace such as redesigning equipment to eliminate noise sources and constructing barriers that prevent noise from reaching a worker.

Administrative controls such as task sharing should be considered where practicable to reduce the duration of exposure to noise.

Whenever elimination, substitution, engineering controls and administrative practices cannot consistently and practicably reduce the worker's noise exposure below 85 dBA $L_{ex, 8}$, then hearing protection devices are required to be used.

3.3 Selection

HPD's shall meet the requirements of the hazard identification and risk assessment (HARA).

HPDs shall be selected based on the desired noise reduction, comfort and suitability of the HPD for the worker and environment.

Specific HPD's are selected based on desired noise reduction which can be estimated with any of the methods listed in CSA Standard Z94.2-14.

3.3.1 Noise Exposure Range 85 dBA $L_{ex, 8}$ to 105 dBA $L_{ex, 8}$

Hearing protection shall be adequate to reduce ambient levels below 85 dBA but not less than 70 dBA at the worker's ear. Over-protection will have a negative effect on communication

The simplest method for assessing if the selected hearing protector is adequate for ambient noise exposures above 85 dBA $L_{ex, 8}$ but below 105 dBA $L_{ex, 8}$ is to use the manufacturer's Noise Reduction Rating number, after applying a de-rating factor for the type of hearing protector. The NRR is printed on the original manufacturer's packaging.

The manufacturer's Noise Reduction Rating (NRR, based on ANSI Standard S3.19 (1974)) shall be de-rated as follows, to account for the significantly reduced protection under real world condition of use:

Device Type	% of NRR Actually Achieved in Use	Predicted dBA effective at the ear
Earplugs	50%	L_{eq} – (NRR x 0.5) - 3
Earmuffs	70%	L_{eq} – (NRR x 0.7) - 3
Earplugs used under earmuffs	65%	L_{eq} – ((NRR of highest rated device + 5) x 0.65) - 3

Note: Additional -3 dBA adjustment applied to NRR to calculate effective dBA sound levels at the ear from measured ambient noise levels in dBA.

3.3.2 Noise Exposures above 105 dBA $L_{ex, 8}$

When the noise exposure exceeds 105 dBA $L_{ex, 8}$ both ear plugs and muffs worn together are recommended.

For ambient noise exposures greater than or equal to 105 dBA $L_{ex, 8}$ the Octave Band Computation (CSA Z94.2 Method "D") is required to accurately predict the noise reduction. Contact the Health and Safety Deparment to obtain technical assistance in this situation.

3.3.3 Selection for extended work shifts

For extended work shifts (e.g., 12 hour shifts), the exposure limit used in selecting a HPD must be reduced.

The simplified table below provides the adjusted noise exposure limit equivalent to 85 dBA $L_{ex,\ 8}$ for extended work shifts:

Exposure Time (hours)	Adjusted Exposure Limit, dBA $L_{ex,8}$
Less than or equal to 8	85
8 to 10	84
10 to 12	83
12 to 16	82

Appendix 1 provides adjusted hour by hour noise exposure limits for 4 to 16 hour work periods

3.3.4 Selection of HPDs for special circumstances

Selection of HPDs for any special cases such as hearing loss, communication and audibility needs, a combination of noise and ototoxic chemicals or vibration shall be done in consultation with .

3.4 Use

Hearing protectors shall be worn where hazard identification and risk assessment identifies the requirement.

Hearing Protectors shall be used as per the manufacturer specifications and instructions.

A proper fit shall be ensured when using hearing protectors:

Earplugs are placed into (not against) the entrance of the ear canal to form a seal.

Earmuffs are placed snugly against the sides of the head to form an airtight seal around the ear. Adjust the muff to provide the best possible seal while wearing safety glasses. Hair, jewelry, or clothing worn shall not be worn in such a manner as to be caught between the cushion of the muffs and the head. Protective eye wear that comes between the cushion of the muff and the head will reduce the protective capability of the ear muffs.

Hearing protection shall not be modified.

3.5 Inspection

Hearing protectors shall be inspected for obvious defects prior to use. Inspect muffs for possible defects such as cracked cups, hardened or deformed cushions, or leaking liquid-filled cushions. Inspect band tension for loosening.

3.6 Care

Clean hands before handling disposable and reusable ear plugs.
Re-usable ear plugs and ear muffs shall be cleaned regularly according to the manufacturer's

requirements.

Earmuff cushions shall be replaced in accordance with the manufacturer's instructions as soon as they lose their shape, become hard or brittle, show evidence of cracks, or otherwise lose their performance qualities. If in doubt, replace.

3.7 Provisioning

Hearing protection shall be supplied through SaskPower Central Stores or through the Division purchasing process.

Hearing Protection shall meet the requirements of CSA Standard Z94.2-14 Hearing Protection Devices – Performance, Selection, Care, and Use.

3.8 Monitoring Worker Exposure

Where tasks are required to be performed in identified noise exposure areas, worker exposure shall be assessed by a competent person.

3.9 Record Retention

SaskPower shall retain copies of all summary reports in accordance with the Safety Management System Control of Records Procedure and the SaskPower Privacy Policy.

Noise surveillance measurements records shall be retained at each Division as long as the Division is operational.

4.0 REFERENCES

- Saskatchewan
  - *The Occupational Health and Safety Regulations, 1996*
  - "Noise in the Workplace", Saskatchewan Occupational Health and Safety publication (see: http://www.lrws.gov.sk.ca/noise-workplace).
- SaskPower (located on SafetyNet)
  - Hazard Controls Policy
  - Job Hazard Assessment Policy
  - Personal Protective Equipment Policy
  - Hazard and Risk Assessment Standard
  - Hearing Conservation and Noise Control Standard
  - Safety Rulebook
- Third Party
  - CAN/CSA Z94.1-14 Hearing Protection Devices - Performance, Selection, Care, and Use.

Appendix 1: Noise Exposure Limits for extended work shifts

For extended work shifts (e.g., 12-h shifts), the exposure limit used in selecting a HPD must be reduced.

The table below provides the adjusted noise exposure limit equivalent to 85 dBA $L_{ex\ 8}$ for extended work shifts:

Exposure Time (hours)	Adjusted Exposure Limit, dBA $L_{ex\ 8}$
4	88.0
5	87.0
6	86.3
7	85.6
8	85.0
9	84.5
10	84.0
11	83.6
12	83.2
13	82.9
14	82.6
15	82.3
16	82.0