February 2013

ANSI/ASSE A10.46-2013 – BACKGROUND MATERIALS

Hearing Loss Prevention in Construction and Demolition Workers

Name: ANSI/ASSE A10.46-2013 (Effective Date of 2/23/2013)

Scope and Background Materials

1.1 Scope. This standard applies to all construction and demolition workers with potential noise exposures (continuous, intermittent and impulse) of 85 dBA and above.

1.2 Purpose. This standard is intended to help employers prevent occup-pational hearing loss among construction and demolition workers.

2. DEFINITIONS

2.1 Administrative Controls. Methods of managing noise-exposed workers’ activities that have the effect of limiting each worker's exposure to hazardous noise. Appendix 1 has examples of administrative noise controls.

2.2 Attenuation. The amount of sound in decibels by which an engineering control measure or a hearing protection device can reduce an individual's noise exposure level.

2.3 Audiogram. A chart, graph or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

2.4 Baseline Audiogram. The audio-gram against which future audiograms are compared.

2.5 Continuous Noise. Noise that remains at a steady level and has a variation in level that involves maxima at intervals of one second or less.

2.6 Decibel (dB). Unit of measurement of sound pressure level.
2.7  **Decibel, A Weighted (dBA).** Unit representing the sound level measured with the A-weighting network on a sound-level meter. The A-scale discriminates against very low frequencies (as does the human ear) and is therefore more appropriate for determining worker exposure to noise.

2.8  **Derating.** An adjustment that is made to the Noise Reduction Rating (NRR) that is intended to estimate how hearing protectors perform in the field for populations of users as compared with laboratory measurements.

2.9  **Double Hearing Protection.** Simultaneous use of earmuffs and earplugs

2.10  **Engineering Controls.** Methods of reducing noise levels that involve changes at the noise source or along the noise transmission path. Appendix 1 has examples of engineering controls.

2.11  **Exchange Rate.** The increase or decrease in average noise level in decibels, which warrants a doubling or halving of the noise dose. For example, an increase in noise level from 85 to 88 dBA warrants a decrease in allowable exposure time from eight to four hours, according to the three dB exchange rate used in this standard.

2.12  **Hearing Protection Devices.** (HPD). Devices, also called hearing protectors, worn to reduce the sound level in the ear canal.

2.13  **Hertz (Hz).** Unit of measurement of frequency, numerically equal to cycles per second.

2.14  **Impulse Noise.** A transient noise having less than 1 second duration, which may repeat after a delay of more than one second for example, pile driving, or single loaded powder-actuated tools.

2.15  **Intermittent Noise.** Noise that fluctuates in level over time or that is interspersed with periods of quiet.

2.16  **Noise Dose.** The ratio, expressed as a percentage, of (1) the time integral, over a stated time or event, of the 0.6 power of the measured slow exponential time-averaged, squared A-weighted sound pressure and (2) the product of the criterion duration (eight hours) and the 0.6 power of the squared sound pressure corresponding to the criterion sound level (90 dB). It is commonly expressed as a percentage of the allowable limit.

When the daily noise exposure consists of periods of different noise levels, the daily dose (D) shall not equal or exceed 100, as calculated according to the following formula:

\[ D = \left[ \frac{C_1}{T_1} + \frac{C_2}{T_2} + \ldots + \frac{C_n}{T_n} \right] \times 100, \]

where

- \( C_n \) = total time of exposure at a specified noise level,
- \( T_n \) = exposure duration for which noise at this level becomes hazardous.”
2.17 **Noise Reduction Rating (NRR).** The single number rating of the attenuation of a hearing protection device that has been defined according to the U.S. Environmental Protection Agency regulation 40 CFR 211 subpart B.

2.18 **Overprotection.** The use of hearing protection devices with an inappropriately high amount of attenuation. Attenuation exposure levels below 70 dBA shall be considered overprotected and shall be avoided.

2.19 **Shall.** The use of the word shall is to be understood as mandatory and having the same effect as must or will.

2.20 **Should.** The use of the word should is to be understood as advisory and having the same effect as recommended.

2.21 **Standard Threshold Shift (STS).** An average decline, as compared to the baseline audiogram, in the audiometric thresholds in either ear of 10 dB or more at two, three and four kHz compared to the baseline audiogram.

2.22 **Time-Weighted-Average (TWA).** The sound level, which if applied constantly over an eight-hour period would result in the noise dose received during the measured period. TWA measurements shall cover a range of 80-140 dB, shall be A-Weighted, shall use a criterion level of 85 dBA, an exchange rate of three dB, and a criterion time of eight hours. ANSI S3.44, *Determination of Occupational Noise Exposure and Estimation of Noise-Induced Hearing Impairment*, describes how to calculate TWA.

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Links and information related to the A10.46 American National Standard

- Official Memorandum of Understanding Between OSHA & ANSI
- Office of Management & Budget Circular OMB-A119
- Safeguarding: Are ANSI Standards Really Voluntary?
- Standards History Article
- Position Statement on Consensus Standards
- What’s the Difference Between an OSHA Rule and an ANSI Standard?

Examples of Recognition

U.S. DOL/OSHA:


State government example:

CAOHC:


Global recognition example:

http://www.wsib.on.ca/WSIBPortal/faces/WSIBDetailPage?cGUID=WSIB013780&rDef=WSIB_RD_ARTICLE&_afrLoop=96833200772000&_afrWindowMode=0&_afrWindowId=null#%3F&GUID%3DWSIB013780%26_afrWindowId%3Dnull%26_afrLoop%3D96833200772000%26rDef%3DWSIB_RD_ARTICLE%26_afrWindowMode%3D0%26_adf.ctrl-state%3Du0sr6v0ed_4