



## Glossary of Key Hearing Loss Prevention Program Terms

**Acoustic Trauma:** Documented single or clustered events producing significant damage to the cochlea [e.g. explosion, head/ear concussion, perforated eardrum]

**Action Level:** A defined measurement (defined by a controlling authority) necessitating an intervention to affect desired conditions. [OSHA has defined certain action levels that when met or exceeded necessitate administrative and/or engineering controls intervention to reduce the risk of noise-induced hearing loss. OSHA currently uses an 8-hour time weighted average of 85 dBA action level to implement an effective Hearing Loss Prevention Program].

**Administrative Controls:** Clerical actions implemented by facility management to reduce worker noise exposure levels. [e.g. managing workers' schedules, traffic patterns, etc]

**Attenuation:** To lessen the amount, force, magnitude, or value of <sup>1</sup>. [In the world of hearing loss prevention, this term is most commonly associated with the level of attenuation provided by hearing protectors (NRR-Noise reduction Rating) which is generated in optimum *clinically based* environments which are not indicative of "real world" performances/uses].

**Audiometric Zero:** 0 dBHL. [See **dB (Decibel)** definition]

**Audiologist:** An audiologist is a licensed health care professional who diagnoses, evaluates, and treats hearing disorders and communication problems.

**Baseline (audiogram):** The first *valid and reliable* audiometric test on record to which annual or periodic audiograms are compared.

**Conductive Hearing Loss:** A hearing loss classification documented to exist due to pathology affecting the outer or middle ear's ability to conduct sound to the inner ear [e.g. earwax, eardrum perforation, ear infection, Otosclerosis]

**dB (Decibel):** A unit of measurement used to quantify sound pressure level.

[Noise is generally specified in the SPL decibel scheme. SPL refers to Sound Pressure Level. All sound has a measured sound pressure level, expressed in dB SPL. The range of possible sound pressure levels is vast and in fact logarithmic. Scientist years ago found it far too cumbersome to discuss and quantify human threshold levels in dB SPL. Based upon data taken from normal healthy ears, normative threshold values were obtained at all frequencies audible to the human ear and the *human audibility curve* was developed. The **DB HL** is a

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<sup>1</sup> Webster's Dictionary



decibel scheme used in audiometric testing. **HL** refers to *Hearing Level*. By definition, each point on the *human audibility curve corresponds to audiometric zero or 0 dB HL*. When you are told that you have a threshold of 20 dB at 1000 Hz, you are being told that you have a threshold of 20 dB **HL**].

**Dose (Noise Dose):** A noise exposure expressed as a percentage of the allowable daily exposure. [The OSHA noise standard states that a 100% noise dose equals an 8-hour exposure to a continuous 90 dBA noise. A 50% dose is an 8-hour exposure to an 85 dBA noise or a 4-hour exposure to a 90 dBA noise.<sup>2]</sup>

**Dosimeter (Noise Dosimeter):** An instrument used to measure a test subject's (employee) noise exposure level. [Most noise dosimeters measure noise over extended periods to produce these common quantifiers: A Time Weighted Average noise exposure, Noise Dose, Peak Sound Level, Equivalent Sound Level.]

**Engineering Controls:** Physical actions implemented by facility management to reduce worker noise exposure levels. [e.g. installing noise barriers, dampeners, etc]

**Exchange Rate:** OSHA mandates a *Permissible Exposure Limit (PEL)*. Noise exposure duration is limited by mandate. OSHA mandates a PEL of 90 dB for an 8 hour period. Most US regulations mandate **5 dB exchange rates** in relationship to the PEL, thus a 90 dB exposure is permitted for 8 hours. A 95 dB exposure is permitted for 4 hours, etc.

**Hearing Loss Prevention Program Audit:** "An assessment performed prior to putting a hearing loss prevention program into place or before changing an existing program"<sup>3</sup>

**Hz (Hertz):** A unit measurement used to quantify the number of cycles per second contained in a pure tone sound source. A 1000 Hz pure tone consists of 1000 cycles (compressions and rarefactions) in 1 second duration. [Humans are capable of detecting frequencies between 20-20,000 Hz. A typical pure tone air conduction hearing test determines threshold values at 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hz.]

**Impulse Noise:** A common classification of occupational noise measured to possess short duration and high intensity (dB) acoustical characteristics. [Gunfire is an example of impulse noise.]

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<sup>2</sup> NIOSH <http://www.cdc.gov/niosh/hpterms.html>

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**Impact Noise:** A common classification of occupational noise measured to possess extended durations and high intensity (dB) acoustical characteristics. [A metal stamping machine might generate impact noise.]

**Noise-Induced Hearing Loss:** A pattern of hearing loss possessing certain audiometric well-defined, research documented characteristics consistent with unprotected exposure to high levels of noise.

**Noise Reduction Rating (NRR):** A manufacturer generated number used to quantify, in (dB) a hearing protector's attenuation characteristics, generated in optimum *clinically based* environments, which are not indicative of "real world" performances/uses.

**Ototoxic (Agent):** Any substance, that when inhaled, absorbed, or ingested is known to affect potential damage to the inner ear hearing mechanism (cochlea).

**Permissible Exposure Limit (PEL):** OSHA mandates a *Permissible Exposure Limit (PEL)*. Noise exposure level durations are limited by mandate. OSHA mandates a PEL of 90 dB for an 8 hour period. Most US regulations mandate **5 dB exchange rates** in relationship to the PEL, thus a 90 dB exposure is permitted for 8 hours. A 95 dB exposure is permitted for 4 hours, etc.

**Potentially (OSHA) Recordable Hearing Loss Event:** Per CFR 1904 (effective 1/1/2003), a potentially (OSHA) Recordable hearing loss event is defined as a 10 dB Standard Threshold Shift (STS) [age corrected] with a concurrent non-age corrected 25 dB or greater departure from audiometric zero as averaged at 2000, 3000, and 4000 Hz. [*Potential* is used since not all noise-induced hearing loss is occupationally related].

**Presbycusis:** Hearing loss associated and/or attributed to the natural progression of the aging.

**Sensorineural Hearing Loss:** A hearing loss classification stemming from damage to or degeneration to sensory receptors within the inner ear (cochlea) due to genetic or unknown origin.

**Sound Level Meter:** An instrument used to measure the acoustical characteristics present in any noise source.

**Sound Pressure Level (SPL):** Noise is generally quantified in a SPL decibel scheme. SPL refers to Sound Pressure Level. All sound has a measured sound pressure level, expressed in (x) dB SPL in comparison to a known reference sound pressure level (20 mPa-micropascals).



**Standard Threshold Shift (10 dB STS):** A change in hearing as compared to baseline or revised baseline (if applicable) of an average of **10** dB or more at **2000**, **3000**, and **4000** Hz in either ear, age adjusted unless otherwise specified or requested.

**TWA (Time Weighted Average):** A numerical value expressed in dB (A) generated by dosimetry representing actual or estimated noise level exposure over an 8-hour period.

**Work Relatedness Determination:** The process of determining if a potentially (OSHA) Recordable hearing loss event is occupationally related. [Non-occupational determinations allow for the removal or "lining out" of an OSHA Recordable hearing loss event from the OSHA 300 Log.]

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