GLOSSARY OF TERMINOLOGY

TERM	Acronym or Symbol	Description
acoustic trauma		Damage to the hearing mechanism caused by a sudden burst of intense noise, or by a blast. The term usually implies a single traumatic event. Blast noise (e.g., from explosions) are capable of producing acoustic trauma.
action level		The level of exposure to noise at which the employer must take certain actions (implement a hearing conservation program, offer hearing protection, conduct audiometric testing, conduct training, etc.). The OSHA action level for noise is an 8-hour Time-Weighted Average of 85 decibels measured on the A-scale, slow response.
administrative controls		When OSHA PEL exposure levels are exceeded, feasible administrative (i.e. worker-machine rotation, breaks from noise) or engineering controls shall be utilized. If administrative or engineering controls fail to reduce sound levels within OSHA PEL exposure levels, personal hearing protective devices shall be provided to the employee by the employer, and used to reduce sound levels to within the levels of OSHA PEL exposure levels.
ambient noise		The total of all noise in the environment other than the noise from the source of interest. This term is used interchangeably with background noise.
American Academy of Audiology	AAA	n/a
American Academy of Otolaryngology	AAO	n/a
American College of Occupational and Environmental Medicine	ACOEM	n/a
American Industrial Hygiene Association	AIHA	n/a
American National Standards Institute	ANSI	n/a
area noise measurement		The simplest kind of monitoring, where noise level readings are taken in different areas of the workplace, and the outcome is usually a "noise map" of the area.
attenuation		The reduction in sound pressure level in dB which occurs as a person moves further and further away from a noise source (i.e. moving out-of-doors or down an air-conditioning duct system). Also, the amount of noise reduction provided by hearing protective devices.
audiogram		The chart, graph, or table showing hearing threshold level as a function of frequency; a method of measuring degree of hearing loss.
audiologist		An audiologist is a professional who diagnoses, treats, and manages individuals with hearing loss or balance problems.
audiometer		An electronic instrument used for measuring hearing threshold levels that conforms to the requirements and specification of the current American National Standard Institute (ANSI) S3.6-1996.
audiometric database analysis	ADBA	Used to evaluate the effectiveness of hearing conservation programs. Generally suggested for companies with more than about 30 employees. The method involves examining audiograms taken over a period of at least 5 or 6 years. The audiometric database comprises the ultimate test of HCP success, since it provides evidence of whether occupational hearing loss is being prevented.
average sound level	L_{OSHA}	OSHA defines this as an A-weighted average sound level, with 5dB exchange rate and slow meter practice.
a-weighting		A pitch/frequency response filter adjustment which makes its reading conform, very roughly, to the human ear response at a loudness level of 40 phons.
a-weighted	dBA	Sound level that has been filtered with the A-weighting network of the sound level meter; commonly used in describing environmental and occupational noise.
background noise		The total of all noise in a system or situation. In popular usage the term "background noise" means the noise in the environment other than the noise from the source of interest.
baseline audiogram		The audiogram obtained from an audiometric examination administered before employment or within the first 30 days of employment which is preceded by a period of at least 12 hr of quiet. The baseline audiogram is the audiogram against which subsequent audiograms will be compared for the calculation of a standard threshold shift.
broadband noise		Noise with components over a wide range of frequencies.
Council for Accreditation in Occupational Hearing	CAOHC	A non-profit organization dedicated to the establishment and maintenance of training standards for those who safeguard hearing in the workplace. The council is comprised of representatives from audiology, physician, nurse, industrial hygiene, safety and engineering professional organizations, all with an interest in hearing loss prevention.

Conservation.		
ceiling limit		An occupational exposure limit that must not be exceeded at any time. Both OSHA and NIOSH state that exposure to continuous, varying, intermittent or impulsive noise shall not exceed 140 dBA.
cerumen		Earwax, which is produced by glands located in the external auditory meatus. Its function is to lubricate the skin and to prevent foreign objects from entering the ear.
Code of Federal Regulations	CFR	A codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government. The Occupational Safety and Health Administration's regulations are found in Title 29 (Regulations Related to Labor).
conductive hearing loss		Hearing loss caused by an impedance of the conduction of sound through the outer and middle ears. This type of hearing loss is not associated with noise exposure.
continuous noise		A type of constant, unchanging noise, often generated by turbines, air conditioners or fans.
decibel	dB	The unit used to express the intensity of sound (sound pressure level). The decibel scale is a logarithmic scale in which 0 dB approximates the threshold of hearing in the middle frequencies for young adults. The threshold of discomfort is usually noted between 85 and 95 dB and the threshold for pain is between 120 and 140 dB.
derate		To use a fraction of a hearing protector's noise reduction rating (NRR) to better estimate the true noise exposure of a worker wearing that hearing protector.
dose		The amount of actual exposure relative to the amount of allowable exposure. A noise dose of 100% and above is considered hazardous.
dosimeter		A special battery-powered sound level meter that is worn by the worker being monitored for noise exposure. It continuously computes TWA and noise dose using a specified exchange rate for trading sound level and exposure duration. The rate for OSHA is 5 dB increase per halving of time. Also measures sound levels over a specified time, stores the measurements, and calculates dose, time-weighted average and (perhaps) other parameters such as peak level, equivalent sound level, and sound exposure level.
dosimetry		The easiest and most accurate method for determining time-weighted exposure of an individual, using a dosimeter. This is particularly suited for situations where there is any significant degree of employee mobility and/or intermittent noise exposure.
Engineering controls		When OSHA PEL exposures are exceeded, feasible engineering controls (i.e. quieter machinery, noise path absorbers or barriers, mufflers, or equipment isolation) or administrative controls shall be utilized. If such controls fail to reduce sound levels within OSHA PEL exposure limits, personal hearing protective equipment shall be provided to the employee by the employer and used to reduce sound levels to within OSHA PEL limits. The preferred method of noise control is engineering to reduce the noise at its source by engineering controls.
Equivalent continuous noise level	L_{eq}	Varying, intermittent or impulsive noise exposure that is equal in energy to a continuous noise level for a certain duration. Technically, it is ten times the logarithm to the base ten of the ratio of time-mean-square instantaneous A-weighted sound pressure, during a stated time interval T, to the square of the standard reference sound pressure. Unit, dB; respective abbreviations, TAV and TEQ; respective letter symbols, LAT and LAeqT (ANSI S1.1-1994: time-average sound level; time-interval equivalent continuous sound level; time-interval equivalent continuous A-weighted sound pressure level; equivalent continuous sound level).
exchange rate		The amount of Increase In sound-level, In decibels, which would require halving of the allowable exposure time to maintain the same noise dose. Defined as how sound level and exposure duration are exchanged or traded. OSHA uses a 5 dB exchange rate. NIOSH recommends a 3 dB exchange rate.
fence		The hearing threshold level above which a material impairment of hearing is considered to have occurred. OSHA has defined the fence as 25 dB average threshold across 2,3 and 4 kHz in reference to audiometric zero.
frequency		The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second, or Hz. Subjectively perceived as pitch. The number of sound waves or vibrations in a specified time period. The rate can vary and the number of times per second a cycle pattern repeats itself defines a sound's frequency. The unit of measurement is cycles per second (CPS) or Hertz (Hz).
hazardous noise		Any sound for which any combination of frequency, intensity, or duration is capable of causing permanent hearing loss. Most experts agree that noise above 85 dBA is hazardous.
hearing conservation program	HCP	Required by the Hearing Conservation Amendment (1983) which requires that a hearing conservation program be administered when employee noise exposures are 85 dBA TWA on slow meter response. This corresponds to a 50% noise dose (OSHA action level).
hearing disability		A specified amount of permanent hearing loss usually averaged across several frequencies which negatively impacts employment and/or social activities.
hearing impairment		A degree of hearing loss, temporary or permanent, due to many causes. Hearing loss can be caused by illness, disease, or by exposure to excessively high noise levels.

Hearing Protection Device	HPD	A hearing protection device is a personal safety product (such as an earplug or earmuff) that is worn to reduce the harmful auditory and/or annoying effects of sound.
hearing threshold level	HTL	The amount, in decibels, by which the threshold of audibility for an ear differs from a standard audiometric threshold. It is the softest level that a person can hear a pure tone generated by an audiometer at a given frequency. The unit of measurement is decibel, hearing threshold level (dB HTL).
impact-type noise		Noise created by the impact of one mass in motion upon another mass either in motion or at rest. This type of noise is described as "transient" as it is less than one second in duration, and which may be repeated after a delay of more than one second.
impulsive noise		A sound which rapidly rises to a sharp peak and then quickly fades and is less than 1 second in duration. The sound may have a "ringing' quality (such as a striking a hammer on a metal plate or a gunshot in a reverberant room). Impulsive noise may be repetitive, or may be a single event (as with a sonic boom). Also called impact and impulse noise. If impulses occur in very rapid succession (such as with some jack hammers), the impulse noise is described as continuous.
intermittent noise		Noise levels that are interrupted by intervals of relatively low sound levels. An example of this type of noise exposure is a person making trips from one type or noise to another several times during a normal working day (i.e. the inspector or facility supervisor who periodically makes trips from a relatively quiet office into noisy production areas may be subject to this type of noise).
inverse square law		Sound levels fall off with distance from the source. Sound level decays 6 dB from source point for every doubling of distance.
kilohertz	kHz	A kHz equals 1000 Hz.
Mine Safety and Health Administration	MSHA	n/a
National Hearing Conservation Association	NHCA	n/a
National Institute for Occupational Safety and Health	NIOSH	The National Institute for Occupational Safety and Health (NIOSH) was established by the Occupational Safety and Health Act of 1970. NIOSH is part of the Centers for Disease Control and Prevention (CDC) and is the only federal Institute responsible for conducting research and making recommendations for the prevention of work-related illnesses and injuries.
noise		Undesired sound. By extension, noise is any unwarranted disturbance within a useful frequency band, such as undesired electric waves in a transmission channel or device.
noise dosimeter		An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.
noise induced hearing loss	NIHL	A pattern of hearing loss possessing certain audiometric well-defined, research documented characteristics consistent with unprotected exposure to high levels of noise.
noise induced permanent threshold shift	NIPTS	Hearing loss suffered as the result of noise exposure, all or part of which is permanent.
Noise reduction rating	NRR	A single number rating required by law to be shown on every hearing protective device sold in the United States. This number is determined by applying a specified procedure in a controlled environment.
occupational hearing conservationalist	OHC	A person who can conduct the practice of hearing conservation, including a pure-tone air conduction hearing evaluation and other associated duties under appropriate supervision, and who can function with other members of the occupational hearing conservation program team.
Occupational Safety and Health Administration	OSHA	A US government agency that was set up in 1971 to ensure safe and healthful conditions on the job for workers. It issues regulations, called standards, that protect workers from various hazards on the job. It is part of the US Department of Labor.
Octave-Band Analyzer	OBA	A sophisticated instrument used to determine where the noise energy lies in the pitch/frequency spectrum. Most commonly used when engineering control of noise problems is planned, because industrial noise is made up of various sound volumes/intensities at various pitches/frequencies.
Otolaryngologist	ENT	A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.
Otologist		A medical doctor specializing in the care and treatment of ear disorders.
ototoxic		A term typically associated with the sensorineural hearing loss resulting from administration of certain prescription drugs and exposure to certain chemicals used in the work environment. The risk of hearing loss can be increased in combination with noise exposure.
peak sound level		OSHA requires that accurate sound level measurements be made of true peak sound

		pressure levels. OSHA requires that peak noise exposures be kept below 140 dB for impulse sound. True peak sound level meter readings must adequately measure a pulse of 100 microseconds in duration.
permanent threshold shift	PTS	Permanent increase in the threshold of audibility for an ear.
permissible exposure limit	PEL	An exposure limit that is published and enforced by OSHA as a legal standard. The PEL refers to levels of exposure and conditions under which it is believed that nearly all healthy workers may be repeatedly exposed day after day without adverse effects. Currently. the OSHA PEL for noise is 90 dBA as an 8-hour Time-Weighted Average (TWA). Exposures at and above this level are considered hazardous.
pitch		The perceived auditory sensation of sounds expressed in terms of high or low frequency stimulus of the sound.
presbycusis		Hearing loss attributed to the aging mechanisms of the ear.
Professional Supervisor	PS	An audiologist, otologist or other physician whose role is to supervise the audiometric testing conducted by the OHC, recommend follow-up procedures, manage the audiometric database, and determine the work relatedness of an employee's hearing loss.
pure tone		A sound characterized by the variations in pressure occurring at only one frequency (singleness of pitch).
qualified technician		A technician who has been certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC), or by another recognized organization offering equivalent certification.
representative exposure		Measurements of an employee's noise dose or 8-hour time-weighted average sound level that the employer deems to be representative of the exposures of other employees in the workplace. This is often obtained through area noise monitoring, personal dosimetry, or a combination of these.
sensorineural hearing loss		A hearing loss originating in the cochlea or the fibers of the auditory nerve.
significant threshold shift		NIOSH uses this term to describe a change of 15 dB or more at any frequency, 500 through 6000 Hz, from baseline levels that is present on an immediate retest in the same ear and at the same frequency.
sociocusis		Hearing loss that results from non-occupational noise sources.
sound level		The sound pressure level In decibels measured using the A-weighting network and a slow response, expressed in the unit dBA.[5] It can also refer to a level of sound expressed as dBA, dBB or dBC, all referenced above the standard sound pressure level of 20 μPa.
sound level meter	SLM	An instrument for the measurement of sound level, sometimes called a noise meter. The instrument contains a microphone an amplifier with a calibrated attenuator, a set of frequency-response networks (weighting networks), and an indicating meter.
sound pressure level	SPL	A measure of the ratio of the pressure of a sound wave relative to a reference sound pressure. Sound pressure level in decibels is typically referenced to 20 uPa. When used alone, (e.g., 90 dB SPL) a given decibel level implies an unweighted sound pressure level.
spectrum		The description of a sound wave's components of frequency and amplitude.
standard threshold shift	STS	As defined by OSHA, a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2,3 and 4 kHz in either ear. Used by OSHA to trigger additional audiometric testing and related followup.
temporary threshold shift	TTS	A temporary increase in the threshold of audibility caused by exposure to high-intensity acoustic stimuli. After removal from the noise source, all or part of the hearing loss suffered is recovered after a period of time.
threshold limit value	TLV	A guideline provided by the American Conference of Governmental Industrial Hygienist to denote the exposure, which when reached or exceeded, may be hazardous. For noise, the TLV is 85 dBA and the exchange rate is 3 dB.
Time Weighted Average	TWA	An average of different exposure levels during an exposure period. A value, expressed in dBA, which is computed so that the resulting average would be equivalent to an exposure resulting from a constant noise level over a 8-hour period. OSHA PEL and action levels are based on this metric.
tinnitus		A condition that frequently accompanies both temporary and permanent hearing loss from noise, as well as other types of sensorineural hearing loss. Often referred to as a ringing in the ears, it is sometimes a precursor to NIHL.
tone		A sound of definite pitch. An electrically generated single-frequency sinusoidal oscillation.
wavelength		The distance a sound wave travels In one cycle. Longer wavelengths are perceived as lower in pitch. Shorter wavelengths, and therefore higher frequencies, are perceived as a higher pitch. The sound's wavelength affects the sound's ability to be stopped by any given material. A very long wavelength will bend around a barrier which would stop a shorter wavelength.

Terminology References:

Berger, EH, Royster LH, Royster JD, Driscoll DP, Layne M. The Noise Manual 5th Edition. AIHA Press 2000

Council for Accreditation in Occupational Hearing Conservation (CAOHC) <http://www.caohc.org/>

Mine Safety and Health Administration. "Compliance Guide to MSHA's Occupational Noise Exposure Standard" < http://www.msha.gov/REGS/COMPLIAN/GUIDES/NOISE/GUIDE303COVER.HTM >

DHHS-NIOSH. " Occupational Noise Exposure, Revised Criteria 1998" (June 1998) DHHS(NIOSH) Publication No. 98-126

US OSHA . 29 CFR 1910.95 "Occupational Noise Exposure" Definitions. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9744

Suter, Alice H. Hearing Conservation Manual Fourth Edition Council for Accreditation in Occupational Hearing Conservation. (Third Printing 2010)

Virginia Polytechnic Institute and State University. Hearing Conservation Definitions. http://www.ehss.vt.edu/programs/HCP_definitions.php