Noise Surveys and Risk Assessments

We are able to offer a full range of basic and detailed noise at work surveys and risk assessments, from basic surveys of individual items of plant and equipment to comprehensive assessments as required by the Control of Noise at Work Regulations 2005. We will select the most appropriate equipment from our wide range of dose meters, integrating noise level meters and frequency band analysers. We use all our own equipment which is calibrated on site prior to use and off site laboratory calibration is also completed annually. As all the noise equipment is our own no additional charges are made for equipment hire.

All noise surveys involve taking a number of spot readings in a variety of locations, along with equivalent readings at worker positions, we will also take readings of the variety of tasks undertaken which use noisy equipment. A frequency band analysis of the noise can also be undertaken to break the noise levels down into their individual tones, this enables us to target specific sound which may be over the legal limits, as it is these harmful sounds which need to be tackled by noise reduction measures. Use of a frequency band analysis is also the most effective method of selecting suitable ear defenders. You will receive a comprehensive report showing details of the noise sources, calculations of personal exposure and peak noise levels, whether these exceed any of the limits within the Control of Noise at Work Regulations 2005, as well as thorough recommendations to assist in meeting the standards required.

CONTACT DETAILS

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20 Years

CAMBRIDGE SAFETY

OCCUPATIONAL NOISE

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TRAINING AND CONSULTANCY

Why?

Health & Safety is an essential part of everyday business life. The HSE (Health & Safety Executive) was set up to help devise and implement safety legislation. They now advise that organisations should be managing their own safety rather than relying solely on external consultants. With this in mind, Cambridge Safety LLP aims to help companies by offering a wide range of training courses and consultancy services.

Who?

Cambridge Safety was established in Peterborough in 1998 primarily to provide assistance to organisations in meeting their legal obligations with respect to health & safety. Through this work it has become apparent that, not only do organisations need competent technical assistance, but also need to give employees at all levels the skills to work safely and to manage health & safety effectively. Cambridge Safety provides a wide range of cost effective training solutions with this aim in mind.

Numerous studies have shown that a safety management system supported by competent employees can provide an organisation with significant cost savings. Avoiding accidents, reducing insurance claims and premiums plus improving morale are some of the many ways in which an effective safety management system can positively affect an organisation.

How?

Our focus is on providing easily accessible development opportunities which is why the majority of our course programmes are provided on a **day-release** basis to enable delegates to fit their development needs alongside their existing work commitments. All our courses are supported by lively enthusiastic presentations, quality handouts and relevant HSE publications. Alternatively we do offer a range of distance learning programmes. Our pass rates for all course programmes exceed the national averages by far, so if you have the commitment, you are in safe hands!

Qualification based programmes
IOSH Managing Safely (3 days)
Nebosh General Certificate (12 days)
Nebosh Environmental Certificate (6 days)
Nebosh Construction Certificate (14 days)
Nebosh Fire Certificate (11 days)
Nebosh Diploma (38 days)
Nebosh Environmental Diploma (14 days)
Nebosh Health and Safety at work (3 days)
Nebosh Environmental Awareness at Work (1 day)

NOISE METERS

There are a variety of noise meters available:-

Simple sound meter— These can be used ***f****or* ***i****ntermittent steady noise and spot checks for one off readings. Usually able to take dB(A) readings but may just give the sound pressure level. These meters may not have the ability to be calibrated, and may not meet BS/EN standards. Thus not suitable for formal noise at work assessments but can at least give an indication.*

Integrating sound level meters*— A weighting and Leq (the noise is measured over the period of sampling) e.g. 85 dB(A) over 35 mins. Calibrated internally or by using an external calibrator. They will be classed as either Type 1 or 2 or Class 1 or 2 depending on their age.*

Dose Meters*—The individual wears the sound meter for their entire day or shift or when completing a certain tasks, but be warned they have an error margin of up to 6dB.*

Frequency (octave) band analyzer - *This type of noise meter can be used to measure the dB(A) and dB(C) but it can also break the sound down into its different tones (frequencies).*

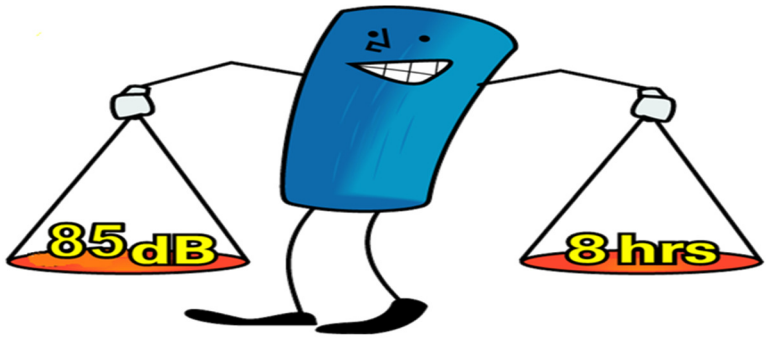
CONTROL OF NOISE AT WORK REGULATIONS 2005

The Regulations are supported by an extensive set of guidance notes in the document L108. In addition there are various British/European standards which assist manufacturers, suppliers and employers in meeting their obligations.

Exposure limit value – 87 dB(A) or a Peak sound pressure of 140 dB (C) this level must not be exceeded even when hearing protectors are worn. (If noise is 98 dB(A) ear defenders must remove at least 11 dB(A))
Lower exposure action level – 80 dB(A) daily or weekly or Peak sound pressure of 135 dB(C), if reached or exceeded action must be taken to reduce risk.
Upper exposure action value – 85 dB(A) daily or weekly exposure or peak sound pressure (137 dB (C)) which if reached or exceeded a range of specified action must be taken.

NOISE LEVELS

TYPICAL NOISE LEVELS



Equivalent noise exposure levels

Consider what noise levels would be the equivalent of 85dB for 8 hours. Using the knowledge we have that 3dB equates to a doubling of sound energy, the same applies to the time of exposure. Hence, doubling the time of exposure will increase the dose by 3dB.

Therefore: 85dB for 8 hours is the same as:

88dB	for	4 hrs
91dB	for	2 hrs
94dB	for	1 hr
97dB	for	30 mins
100dB	for	15mins
103dB	for	7.5 mins

So with very high noise levels, the acceptable daily dose will be reached in a very short time period.

BESPOKE COURSES & CONSULTANCY

Example Skills Courses

General Risk Assessment Refresher ½ day
General Risk Assessment 1 day
Manual handling for employees ½ day
Safety awareness for employees 1 day
Display Screen Equipment Assessor/User ½ day
Chemical safety and COSHH ½ day
Personal Protective Equipment 2 hours
Permits to Work ½ day for awareness and system – 1 day on the specific risks and system.
Confined spaces permit to work systems 1 day
Work at height awareness ½ day
Legionella 1 day
Construction Design and Management 2007 – 1 to 3 days
Safety for Managers 1 day
COSHH assessor 1 day
Manual handing assessor 1 days
Manual Handling Train the Trainer 2 days
Fire regulatory reform order and Fire risk assessment 2 days
Accident investigation ½ day
Corporate killing and corporate manslaughter ½ day
Environmental Awareness ½ - 1 day

H&S Consultancy

We are able to provide both small and large businesses with the support they need to bring their current systems up to the required standards and provide the written material to support any informal standards already in place.

Our aim is to work with you and identify any specific areas of weakness and then actually put procedures or systems in place to upgrade these to meet minimum requirements. This will ensure the company is meeting not only its legal obligations but is also taking its responsibilities to its employees, customers, contractors and others seriously to avoid accidents and injury.

Sound may be defined as any pressure variation (in air, water or other medium) that the human ear can detect, it is the result of air being con-

OCCUPATIONAL NOISE

tinuously compressed followed by rarification (stretching), the frequency or number of compressions per second will determine the tone; the pressure exerted will determine the loudness. A high pitch noise, like a high note on a piano, will be at a far higher frequency e.g. 4000 compressions and stretches a second compared to just 123 for a deep rumble of thunder.

In the UK there are over 170,000 people with significant work-related hearing damage. 14,200 of these are serious enough to receive disablement benefit. There were 150 new disability claims accepted by the Department of Work and Pensions in 2011, numbers have been failing since 1996 and in recent times all the claimants have been males.

Noise is an unwanted sound which has the potential to cause injury. Noise levels of over 80 decibels at the “A” weighting are known to damage the hearing mechanism. Decibels are abbreviated to dB. The “A” is a weighting which means that when sounds are measured we only measure those which can be detected by the human ear, most noise meters will hear a wider range of sounds but by using the “A” filter it makes the meter replicate the human ear.

The decibel is a logarithmic calculated number, 1 plus 1 does not equal two in this case but three, if any noise source is doubled the rise in decibels is 3, this is because the decibel is a result of logarithmic calculations, tables or logs must be used to assist when adding decibels together. Two equal sounds producing 80 decibels will when combined produce 83 decibels, two machines each producing 83 decibels will produce 86 decibels and so on.

The **pitch or frequency** of the sound is measured in hertz, the number of cycles per second. The higher the number of waves or cycles the higher the pitch of the sound. The normal range of hearing for a healthy young person extends from approximately 20 Hz up to 20,000 Hz (or 20 kHz) while the range from the lowest to highest note of a piano is 27.5 Hz to 4,186 Hz.
HOW DO WE HEAR?

The following is a simplified explanation of how humans hear.

NOISE LEVELS

SPL – Sound pressure level – the instantaneous level of sound
$L_{(A)eq}$,t – the equivalent continuous sound level, over period t. Integrates the area under a graph of SPL against time. Not an average, but is a single-number energy equivalent
$L_{(A)EP,d}$ **– (Lepd**) The daily noise dose now also known as Lex.
$L_{(A)eq}$ (Leq) Noise exposure for the period sampled i.e. 85dB(A) recorded for 15 mins.
dB(C)– effectively the ‘C’ weighted peak level – the loudest sound recorded

The $L_{(A)EP,d}$ or Lex are the most important for occupational noise, since the criteria in the Control of Noise at Work Regulations 2005 are expressed as an 8-hr dose.

subjected to noise.

Acute Acoustic Trauma

This can occur after a sudden explosion or very loud sound the hearing mechanism can be damaged irreversibly. This is an acute condition and can lead to total deafness.

Stress / Fatigue

Even low levels of noise at certain pitches can prove stressful and annoying in the workplace. People may lose concentration and therefore be more likely to have an accident.

Occupational Deafness

If a person loses a considerable amount of their hearing they may be eligible for a disability benefit. If sounds have to be 50 decibels before they can be heard this could be classified as occupational deafness if it can be associated with work

CALCULATING DECIBELS

Adding Decibel Levels (add to the highest Decibel figure)

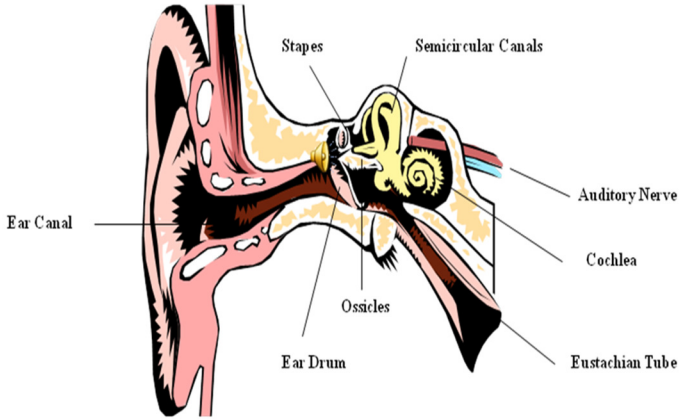
dB Difference	0	1	2	3	4	5	6/7/8	9-12	>12
Total dB	+ 3	2.5	2	2	1.5	1.5	1	0.5	0

Example

104 dB + 109 dB = 5 dB difference = total 109 + 1.5 = 110.5 dB

UNITS OF MEASUREMENT

The basic unit of noise is the decibel, however, there are many noise descriptors used in environmental and occupational acoustics. The important occupational descriptors are described below:



The sound wave travels through the pinna (outer ear) and down the ear canal, vibrating the ear drum. This vibration is passed on through the three little bones (hammer, anvil, and stirrup) into the cochlea (see photo of damaged cochlea later in this section). In here there are millions of little nerve endings which detect sound of different pitches. As they detect relevant sounds they sway and create an electric signal which is sent to the brain, thus we hear.

There are two main types of hearing loss.

Conductive—Sound is not conducted from outer ear to inner ear, this reduces the sound entering the inner ear. This condition results from

fluid in middle ear, foreign bodies, infection in ear canal, impacted ear wax, malformation of ear

Sensor neural—Results from damage to the inner ear or nerve pathways from ear to brain, can be corrected through surgery. This is mainly caused by birth injury, diseases, noise exposure, head trauma and aging.

NOISE RELATED INJURIES

Temporary Threshold Shift

This is when the small nerve endings within the cochlea sway to pass on sound waves, however if they are subjected to loud noise for any period of time, these nerve endings will start to lean over, thus reducing our perception to sound.

This explains why when listening to the car radio, after a short period of time the radio seems quieter, our natural reaction is to turn the radio up. If we forget to turn the radio off when we get out the car, the following morning the radio blasts out. The reason that this sounds so loud the following morning is because on the journey home we were experiencing a temporary threshold shift which reduces the ability to hear certain tones.

Noise Induced Hearing Loss

If we are subjected to noise levels on a continuous basis over a period of time, our nerve endings will not just bend over but will wear away completely. If this happens, our perception to sound is not just reduced but will be completely destroyed at the frequency of the noise experienced. There is no cure for noise induced hearing loss, even a hearing aid will not be able to restore our hearing sufficiently if the nerve endings have completely worn away.

OCCUPATIONAL NOISE

Nerve Endings in Normal Position Damaged Nerve Endings

Tinnitus

This is a ringing or buzzing in the ears, it can be brought on after being subjected to high and continuous levels of noise. The quieter the surrounding noise levels are, the louder the buzzing that is heard by the individual. There is no known cure for this condition however it can affect some people on a temporary basis. This can be an acute or chronic condition.

Acoustic Shock

'Acoustic shock' is a term used in connection with incidents involving exposure to short duration, high frequency, high intensity sounds through a telephone headset or handset. These incidents are associated with a range of physiological and psychological symptoms.

Introduced in 1991 by the Department of Trade and Industry (DTI) specification 85/013 requires manufacturers to incorporate an acoustic limiter in the electronics of headsets to meet the requirements. These devices should ensure that any type of noise (e.g. conversation, short duration impulses) above 118 dB is not transmitted through the headset.

Presbycusis

This is the way in which we all naturally lose our perception to sounds in the higher frequency ranges. Even though this occurs naturally as we age, it can be brought on prematurely by being